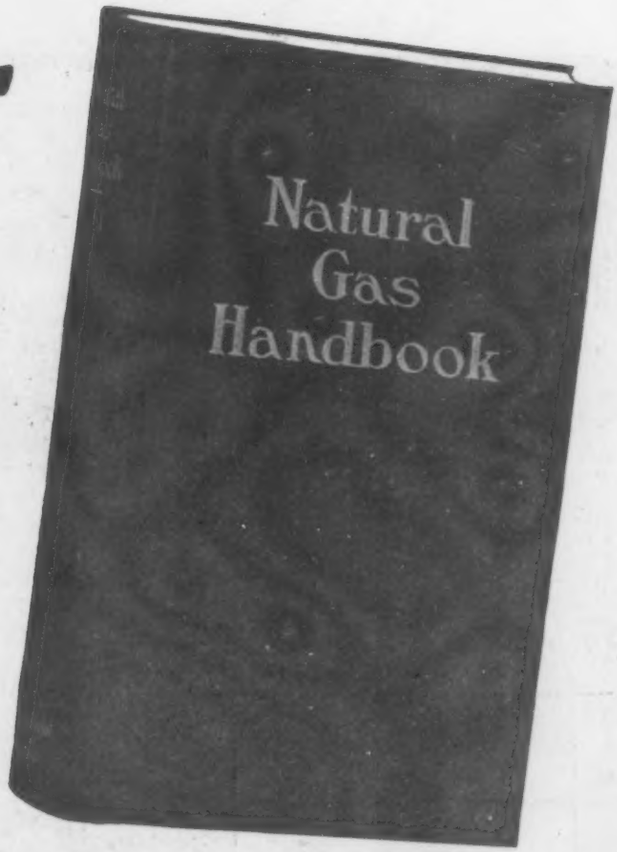
JUST—

Published



Limited 1927 Edition is Now Available

The Basic Book for Gas Engineers

THIS is the 4th edition of the book which has been the basic authority of the gas industry since its first appearance in 1913.

It has run through three editions in less than twelve years without any particular effort being made toward distribution. The 3rd edition was exhausted early in 1925. The new edition is presented to meet the demand that has continued and increased since that time.

This book contains the most comprehensive and authoritative information suitable to the uses of the gas engineer; and complete tables for ready reference by the practical worker. It is considerably advanced in many ways over previous editions; there are new tables and much other valuable data that have not hitherto been made available, and which will be available exclusively in this book.

METRIC METAL WORKS
Erie, Penna.

GENTLEMEN:

Enclose find $.....for which mail, postpaid, the 4th edition of the "Natural Gas Handbook," as follows:

.....copies at $5.00 each—Bound in Cloth

.....copies at $6.50 each—Bound in Leather

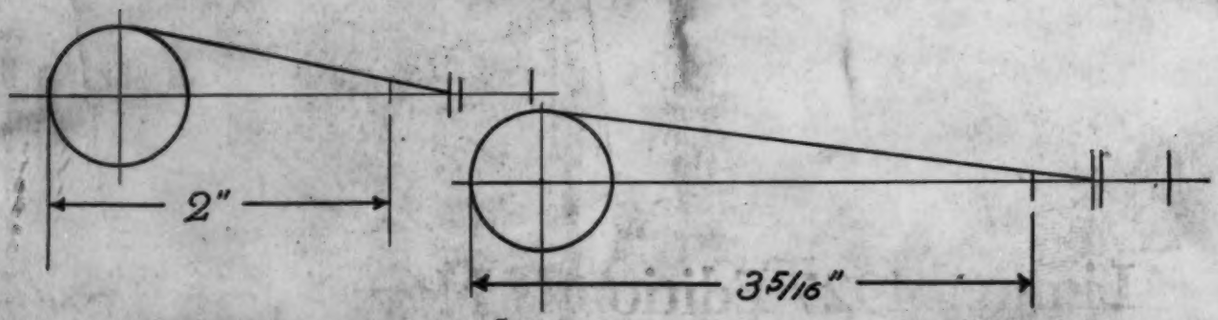
Name.....

Street.....

City.....*State*.....

"A" METERS

23 YEARS RECORD



From 2 inches to $3\frac{5}{16}$ inches---a 60 per cent increase!

A 60% increase in the length of the valve arms of a gas meter means a considerable advance toward perfect uniformity in port openings for corresponding positions of the crank, and a much smoother movement of the meter in operation. This has been accomplished recently in the "A" meter.

The D-slide valve, used continuously in meter construction since 1858, was taken from steam engine design and the valve arm demonstrates a curious phenomenon known as the angularity of a connecting rod. Expressed in the language of the gas meter, this means that the longer the arm in proportion to the diameter of the crank circle (i.e., valve travel), the more equally the valves may be "divided."

The guaranteed minimum capacities are:

5-A	175	cubic feet per hour
10-A	375	" " " "
30-A	875	" " " "
60-A	1500	" " " "
150-A	3400	" " " "

The whole range of customers' demands are met by carrying only five sizes of meters in the stock room.

JOHN J. GRIFFIN & CO.

ESTABLISHED 1858

1513 Race Street, Philadelphia

559 West 47th Street **New York City**

Vol. 127. No. 10 DECEMBER, 1927 Price 25 Cents

AMERICAN GAS JOURNAL

Established 1859 Pioneer of the Gas Industry

Including GAS INDUSTRY Est. 1900

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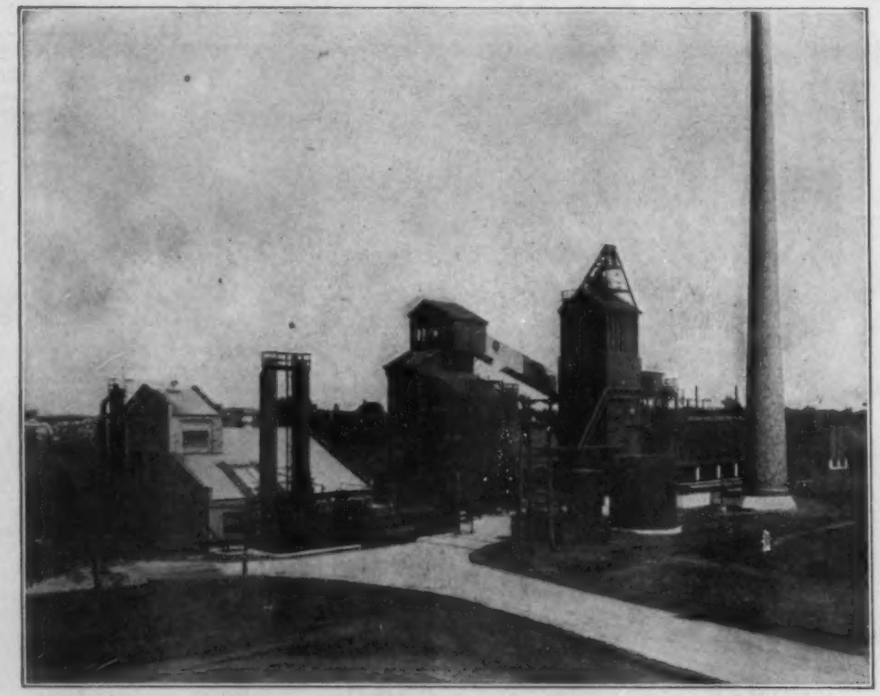
Merry Christmas!

To Every Gasman

SPRAGUE METER COMPANY

BRIDGEPORT, CONN.

Becker Type Ovens of West Boston Gas Company



BECKER TYPE GAS PLANT OF THE WEST BOSTON GAS COMPANY, FRAMINGHAM, MASS.

THE coal gas plant of the West Boston Gas Company at Framingham, Massachusetts consists of 15 Becker Type Ovens, a Koppers Gas Producer, By-Product plant and auxiliaries.

This plant was designed and built by The Koppers Construction Company and has a daily capacity of approximately 1,500,000 cubic feet of gas.

The Koppers Construction Company

Designers and Builders of
BY-PRODUCT COKE AND GAS PLANTS

Chicago Pittsburgh New York

Vol. 127. No. 10 Whole Number 3648

American Gas Journal

Sixty-Eighth Year

December, 1927

Published Monthly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. and Treas. A. M. GLEASON, Sec'y.

H. M. RILEY, Editor

Old Father Time has swung his pendulum to mark again the Christmas season.

The joyous, gladsome season that vibrates with good fellowship and is filled with happy memories; when the hand is stretched forth to grasp those unseen hands of our friends and wish them the choicest of the Yuletide greetings.

It is in such spirit that we extend to all the gas fraternity the world over, to our advertisers and to those who have contributed in any way to our success our most heartfelt wishes for the Merriest Christmas days, with an earnest hope that all their desires will be realized.

AMERICAN GAS JOURNAL.

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AMERICAN GAS JOURNAL, December, 1927, Vol. 127, No. 10. Published monthly by American Gas Light Journal, Inc., New York, N. Y. Entered as second-class matter, January 9, 1917, at the post-office at New York, N. Y., under the Act of March 3, 1879.

Subscription $2.00 per year, including postage, in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines; in Canada $3.00; foreign $4.00. Single copies 25 cents.

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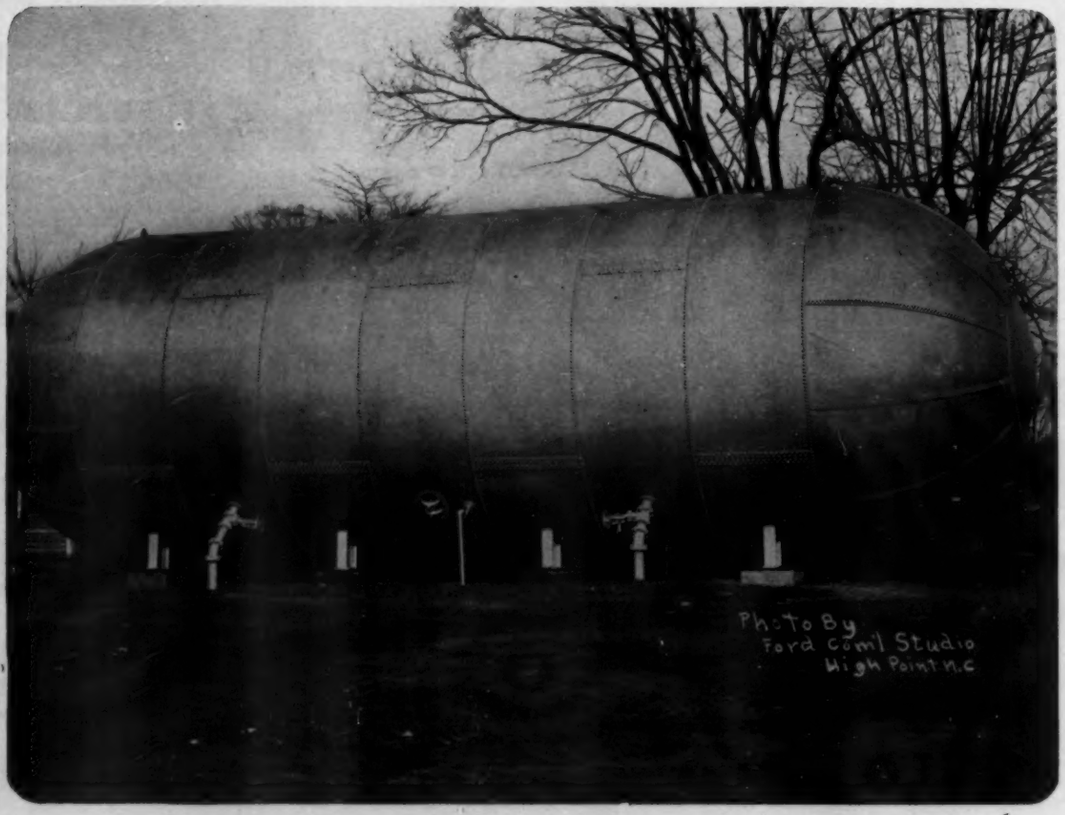

Built for North Carolina Public Service Co., High Point, N. C. Similar Installations Constructed at Winston-Salem, N. C. (2); Orlando, Florida (2); Burlington, N. C.; Greensboro, N. C.; Allegan, Mich.; Plainville, Mich.; Kingston, N. Y.

HIGH PRESSURE TANKS

50,000 CU. FT. OF GAS STORAGE AVAILABLE BETWEEN 5 LBS. AND 50 LBS. PRESSURE
WE BELIEVE OUR QUOTATIONS WOULD INTEREST YOU

Gas Plant Equipment - Gas Holders - Purifiers

THE STACEY MANUFACTURING COMPANY

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THE BUILDERS OF STACEY GAS HOLDERS FOR SEVENTY-SIX YEARS

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When Planning Your Budget—

What plant problems will be met in your 1928 budget:

Increased capacity?
Better yields?
Naphthalene removal?
De-Emulsification?
New Piping?
Additional cooling, scrubbing or purifying facilities?

Adjustment or re-design frequently accomplishes better results than are possible with new equipment. A discussion of your needs and problems with our engineers will not obligate you and may overcome troublesome plant conditions at important savings.

We will submit complete data and recommendations on any gas plant apparatus for guidance in budget preparation.

SEMET-SOLVAY
ENGINEERING CORPORATION
Division Allied Chemical and Dye Corp.
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SMOOT STEAM ACCUMULATOR

Smoot Steam Accumulator and Control System at the Camden Coke Co., Camden, N. J.
The U. G. I. Contracting Co., Engineers and Constructors

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SMOOT CONTROL

U. G. I.

INTERMITTENT CHAMBER OVENS

ARE MAKING A DECIDED IMPRESSION ON

THE GAS INDUSTRY

DURING THE PAST FOUR MONTHS CONTRACTS HAVE BEEN MADE WITH US FOR THE INSTALLATION OF OVENS TOTALING A DAILY CARBONIZING CAPACITY OF 302 TONS OF COAL

THE FEATURES APPEALING TO MANAGERS AND ENGINEERS ARE:—

Compact arrangement and small ground area required

Simplicity of operation with small labor cost

No charging machinery, except weigh larry

Elimination of discharging machinery

Elasticity of operation

Satisfactory operating results and efficiencies

High yield and good coke for water gas sets and domestic consumption

U. G. I. INTERMITTENT CHAMBER OVENS

SOLVE A BIG PROBLEM FOR GAS COMPANY MANAGERS

THE U. G. I. CONTRACTING COMPANY

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421 Peoples Gas Bldg., Chicago **1419 Healey Bldg., Atlanta**

Installation of Sulzer System for Dry Quenching of Coke at Plant of the Rochester Gas & Electric Corporation, Rochester, N. Y.

Where is Dry Quenching Used?

AT By-Product Coke Plants, Gas Works, Low Temperature Carbonization Plants—in fact, wherever hot coke from retorts is now water-cooled—The Sulzer System for Dry Quenching may be profitably substituted.

Dry Quenching produces coke of more uniform quality, having greater mechanical strength, containing less breeze and dust—and, absolutely moisture free.

The sensible heat of the coke, which is entirely wasted in wet quenching, is reclaimed and produces from 650 to 900 pounds of steam per ton of coke dry quenched.

The Sulzer System is simple and flexible in design and is readily adapted to existing plants or to new installations.

In size, the field of application runs the entire gamut of coke plant practice. Sulzer Systems are available for daily capacities of from 10 tons to 1000 tons.

THE Sulzer System for Dry Quenching coke is simple and dependable. The hot coke is charged into a sealed quenching chamber. Inert gases are circulated in a closed cycle by means of a fan, first through the hot coke mass where they absorb the sensible heat of the glowing coke, and thence through a steam boiler where hot gases transfer this heat to the water in the boiler circulatory system and convert it into steam. Literature describing the Sulzer System will be sent upon request.

Dry Quenching Equipment Corporation

INTERNATIONAL COMBUSTION BUILDING — 200 MADISON AVE. NEW YORK ~ N.Y.

A SUBSIDIARY OF INTERNATIONAL COMBUSTION ENGINEERING CORPORATION

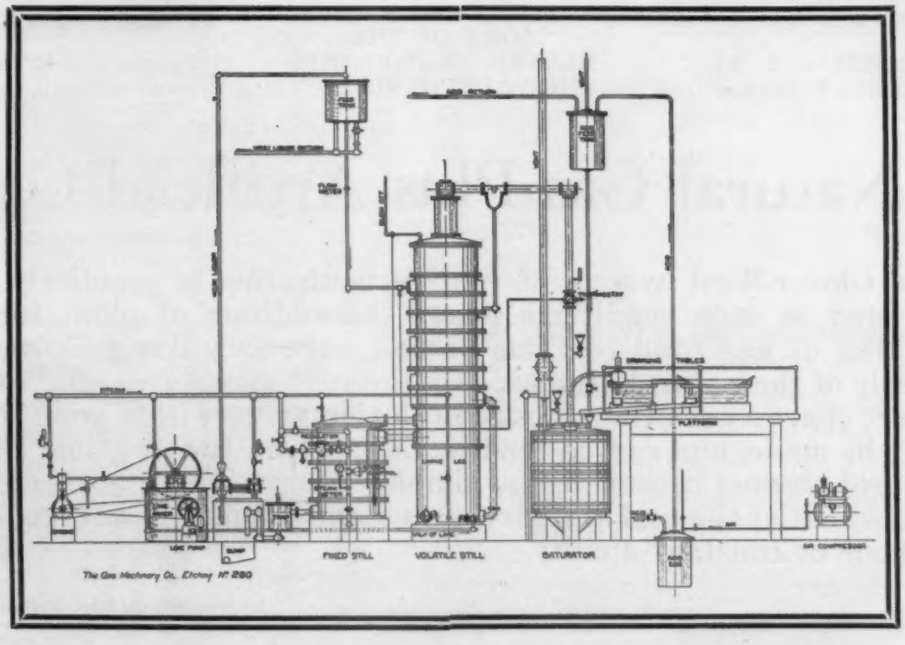
APPARATUS

FOR THE MANUFACTURE OF

SULPHATE of AMMONIA

AND FOR THE RECOVERY OF

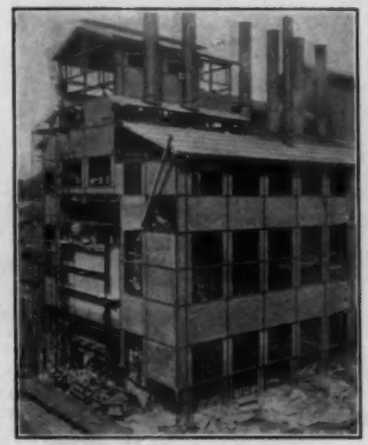
VOLATILE and FIXED AMMONIA



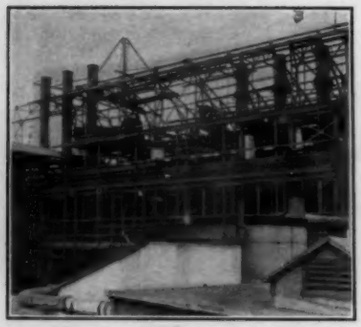
THE GAS MACHINERY COMPANY

CLEVELAND, OHIO

GLOVER-WEST
Vertical Retorts



PAWTUCKET, R. I. (Ext.).
1,060,000 cu. ft. per day.



SPRINGFIELD, MASS. (Ext.).
2,500,000 cu. ft. per day.

SOME OF THE
GLOVER-WEST PLANTS
NOW BEING BUILT

FARIBAULT, MINN.
400,000 cu. ft. per day.

Natural Gas Plus Artificial Gas

The Glover-West system of coal carbonization is peculiarly well adapted to such conditions where the addition of plant for the making of gas from coal has become necessary due to lessening supply of the natural product. By the continuous steaming of the retort charge gas of any desired calorific value within wide limits may be made, and can be readily varied from time to time as the natural product become less available. Glover-West retorts get the utmost out of the coal and give a constant volume of gas from hour to hour of constant quality.

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Builders of Coal Gas Plants

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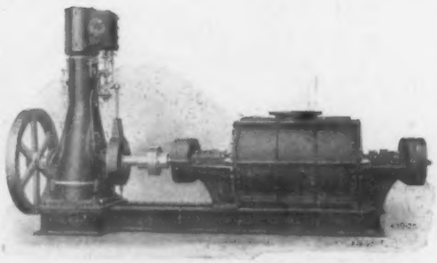
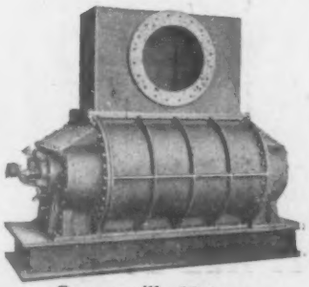
CONNERSVILLE

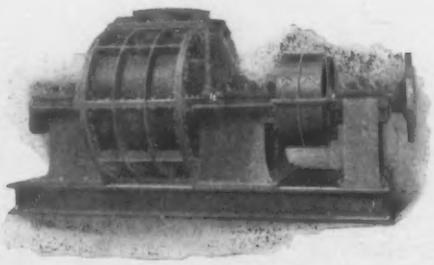
Blowers • Gas Pumps • Meters • Cycloidal Pumps



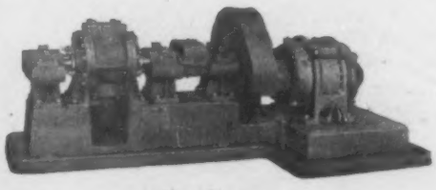
Engine Driven Exhauster



Connersville Meter



Rotary Positive Booster



Tar Pump

The 1928 Budget

Along about next May or June, the old exhauster or the meter or the tar pump will play out and you'll send a requisition along for a new one. But the "higher-ups" will turn it down with "you didn't include it in your budget, so patch it up the best you can and wait till next year. We can't overstep the equipment budget."

Then you say, "Why didn't I ask for that new Connersville equipment last January? I can't make a decent showing with this worn out junk."

Better play safe. Ask our nearest office for prices and put them in your budget now.

The Connersville Blower Company
12th St. and Columbia Ave.
Connersville, Ind., U. S. A.

Sales Offices
114 Liberty Street, New York
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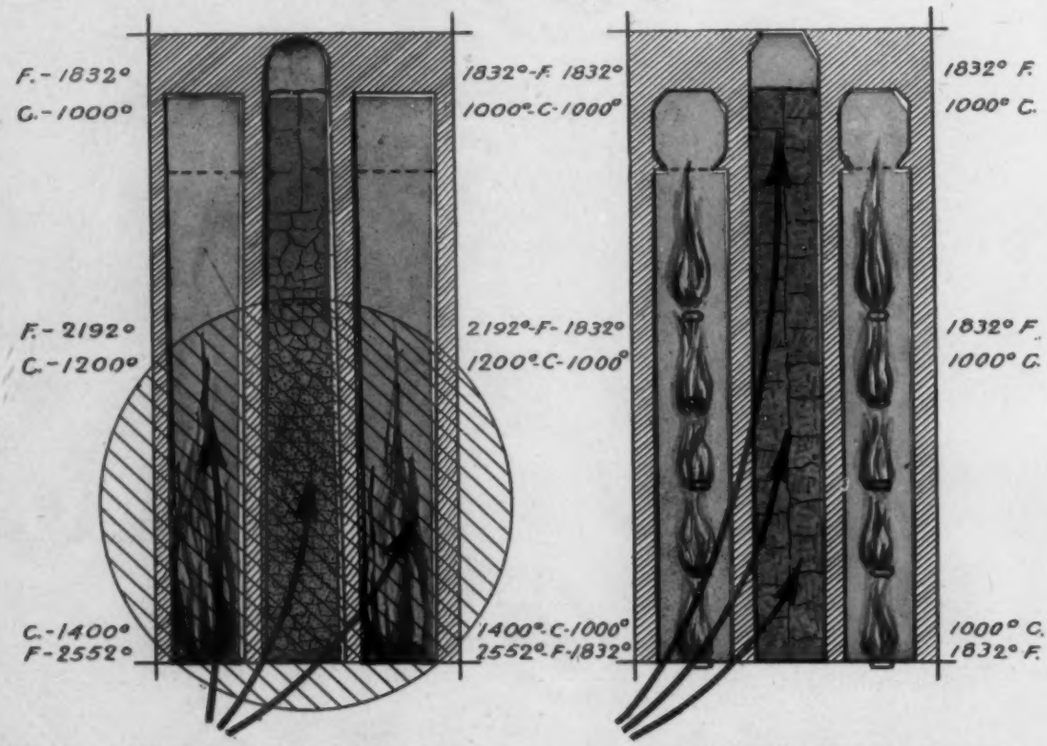
Chamber of Commerce Building, Pittsburgh
Eastern Service Company, Boston

Water Gas Blower

THE PROOF!

Showing the Efficiency of the STILL SYSTEM of MULTI-STAGE COMBUSTION

The demonstration plant, as indicated below, has been in operation for the past six months and is 19 feet 8 inches high



THE COMMON ONE-FLAME METHOD

Note how combustion is practically limited to lower 5′ to 6′ 6″, and only occasional tips of flame reach 7′ 6″.

—and then—

THE CARL STILL MULTI-STAGE COMBUSTION SYSTEM

Note how in the Still System the heating gas is stretched over the entire height of the heating flue—19′ 8″.

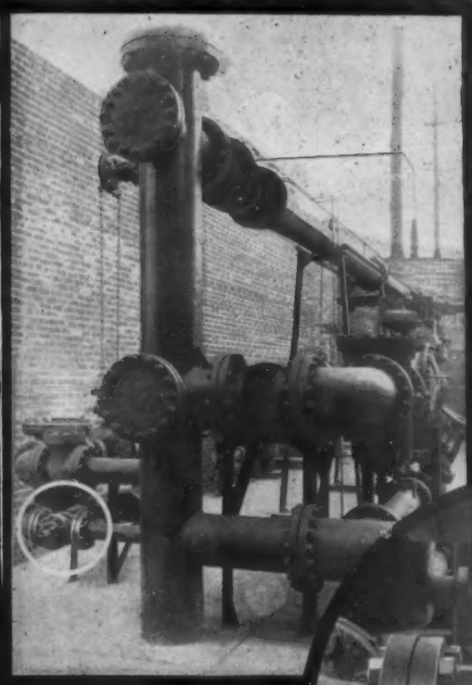
Furthermore—A 40% throttling of the volume of heating gas did not in the least affect the uniformity of the Still System, while the one-flame process was confined to parts in the immediate vicinity of the sole of the flue.

Other strong points of the Still System are:
Excessive Heating eliminated. Utmost protection of Distillation Gases. Highest yield in By-products, and Free Flowing Tar. Fastest operation of ovens and largest possible thruput. Lowest consumption of fuel gas. Unlimited oven height. Maximum safety and minimum labor requirements in operation. Greatest efficiency.

Let our Consulting Engineers give further details

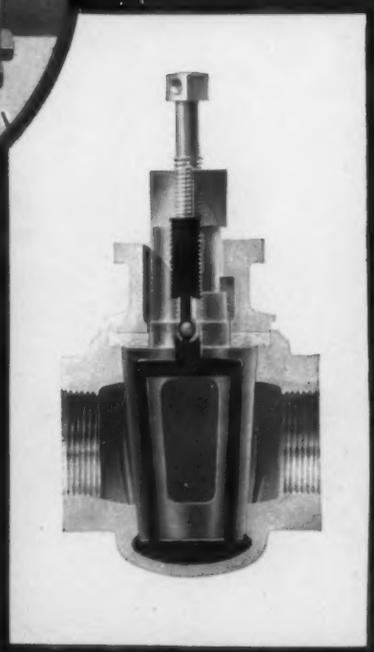
CARL STILL CORPORATION

114 LIBERTY STREET, NEW YORK



The better valve for By-pass Lines

MERCO



Merco Nordstrom Valve

Manufacturers and Users of ... want tight Valves—especially for ... Merco Nordstrom Valves are always tight—ever easy to turn on or off—an exclusive advantage made possible by the unique lubricating principle.

Catalog upon request

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Engineers— Manufacturers

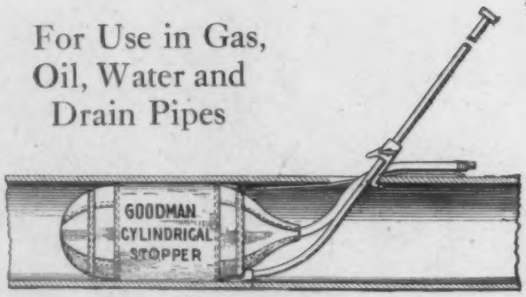
MERCO

AIR LINE MASK
With or Without
Blower
Mask and Blower
in Separate Cases

TO THE MEMBERS OF GAS INDUSTRY *Everywhere*

We Wish You A Right Merry Christmas and a Happy Prosperous New Year

For Use in Gas, Oil, Water and Drain Pipes



Patents Pending

SAFETY GAS MAIN STOPPER CO.

PATRICK GOODMAN, Owner

523 ATLANTIC AVENUE, BROOKLYN, N. Y.

Announcement!

By special working arrangement with Gibbons Bros. of Dudley, England, we are now able to offer the Gas industry of the United States the "Gibbons and Masters" recuperators applied to all Improved Equipment Company's coal carbonizing units (retort benches and ovens).

This is the same recuperator design that has met with so much success throughout Great Britain and the Continent. Six thousand settings in London alone having been thus equipped.

Installed in the United States exclusively

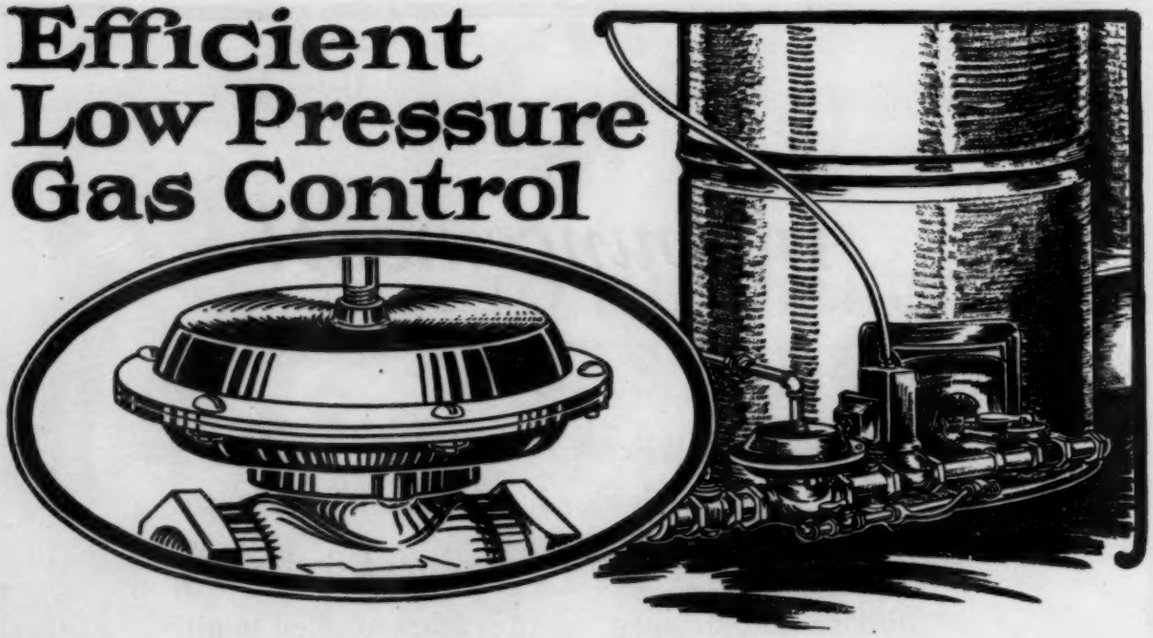
By

THE IMPROVED EQUIPMENT COMPANY

Engineers and Builders

24 STATE STREET, NEW YORK, N. Y.

Efficient Low Pressure Gas Control



ADVANCED ENGINEERING, plus an actual knowledge of today's needs in the low pressure field, has placed Reynolds Low Pressure Governors far ahead of competition. Accuracy that is only rivaled by expensive electric controls—economy first at time of purchase, and later during operation—both are offered in Reynolds Low Pressure Regulators. This unit is characteristically Reynolds in operating simplicity and long dependability.

Many manufacturers have found it profitable to add this unit as standard equipment. This Regulator, operating on an inlet pressure up to one pound, will work from one-half inch to six inches outlet pressure. Our staff will be glad to co-operate. Write.

Reynolds Products

for all kinds of Pressure Reduction—for either artificial or natural gas.

Governors—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

Regulators—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

Valve—
- Automatic Quick-Closing Anti-Vacuum

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

Reynolds Gas Regulator Company
Anderson, Indiana

Established 1892

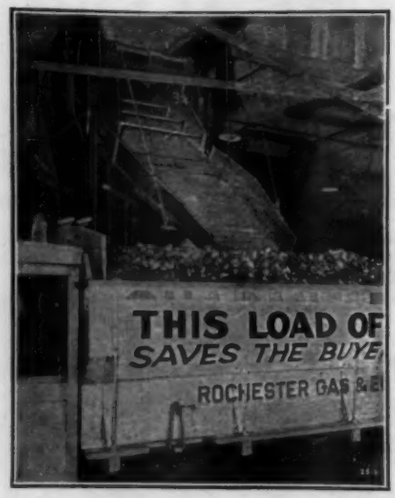
New England Representative: EASTERN SERVICE CO., Boston, Mass.

Gasholders
Condensers
Purifiers
Scrubbers
Tanks
Pipes
Stacks—Flues
Steel Plate Work

CRUSE-KEMPER COMPANY

AMBLER, PENNA.

Western Union Code, Cable Address: Cruskemper, Ambler



Left—Showing one of a battery of twelve Mitchell Electric Vibrating Screens suspended from structural iron work, under coke storage bins, delivering direct to truck.

HUNT

Gas Plant Equipment

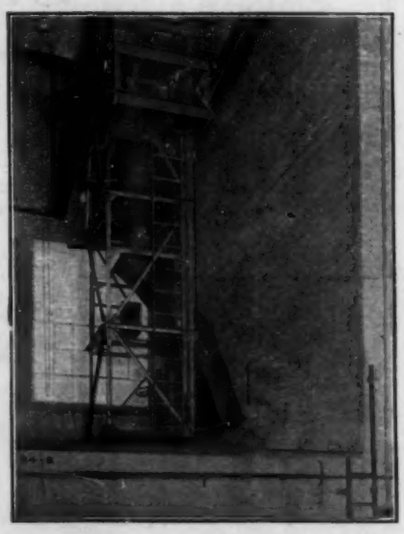
Industrial Railways, Switches, Motor Operated and Push Cars, Automatic Railways, Conveyors, Mitchell Electric Vibrating Screen, Skip Hoists, Bin and Hopper Gates, Weigh Larries, "Stevedore" Manila Transmission and Hoisting Rope and Drilling Cable, Hunt Rope Couplings, Coke Reclamation Plants, Hoisting Equipment, Also Coal Crackers.

Right—This illustration shows a double run of Hunt Pivoted Bucket Conveyors with enclosed gears handling coal in a Middle Western City.

Below—This Hunt Weigh Larry, Hopper and Chute are completely lined with maple wood to protect metal from abrasive action of the coke.

Hunt Equipment is the logical solution to many problems involving the task of storing coal and ashes and for sizing and screening coal and coke in the gas plant, with a long record of success.

In the extension of existing systems, or in planning entirely new systems, Hunt Engineers, with an experience of half a century supplemented by a vast amount of accumulated data, can be of inestimable assistance to the progressive gasman.



WRITE TODAY

We extend to all gasmen our sincerest wishes for A Merry Christmas

C. W. HUNT COMPANY, Inc.

West New Brighton **Staten Island, New York**

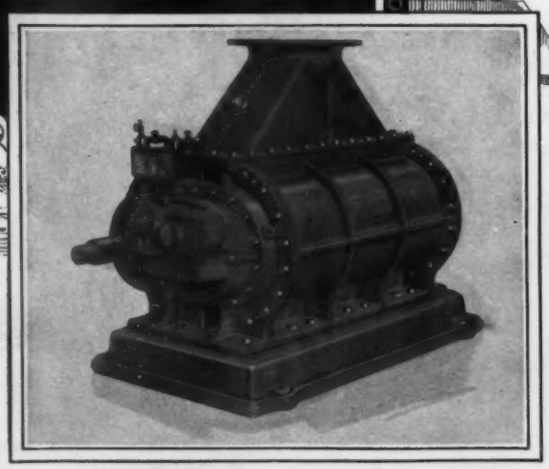
PHILLIPS LANG & CO., Inc.
431 S. Dearborn St., Chicago, Ill.

ENGINEERING EQUIPMENT CO., Ltd.
358 Beaver Hall Square, Montreal

ERNEST F. LEARNED
141 Milk St., Boston 9, Mass.

1 Extreme Accuracy
2 Wide Range of Capacity
3 Negligible Maintenance Cost
4 Small Size
5 Direct Volume Reading
6 Roots Reliability
7 Low First Cost

ROOTS
ROTARY
POSITIVE
METERS



The P. H. & F. M. ROOTS CO.

CHICAGO
People's Gas Building

CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street

Originators of the Double Impeller Rotary Principle

KREICKER 27

EMCO

BALANCED VALVE REGULATORS

Once an EMCO Regulator is installed in the line it is there for good. The REMOVABLE Valve Box of the EMCO High Pressure Regulator makes it unnecessary to tear the Regulator out of the line to make repairs, and the Valve Box size can be changed to take care of increase or decreased consumption.

A spare Valve mechanism on hand assures uninterrupted service, saves time, money and labor.

PITTSBURGH EQUITABLE METER CO.

PITTSBURGH, PENNA.

THE permanent utility and efficiency of Dresser coupled mains, for the transportation of Manufactured Gas, is unquestionable. They are easily and quickly installed. By their use all leakage loss is eliminated, and the cost of maintenance is nil. For this work, the Couplings are equipped with indestructible gaskets, either duck tipped or lead tipped design. Therefore, oil or other condensates will not affect them, and they will remain permanently tight.

S. R. Dresser Manufacturing Co.
Bradford, Penna, U. S. A.

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE and NEW YORK

DESIGNERS AND BUILDERS OF:

Carburetted Water Gas Plants

Complete Coal Gas Plants

By-Products Plants

Salt Water and Fresh Water Condensers

De Brouwer Charging and Discharging Machines

Purifiers - Steel Tanks - Shaving Scrubbers

Vertical Waste Heat Boilers

Gas Holders

View of Main Plant, Located at Baltimore

AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Including GAS INDUSTRY Est. 1900

HENRY M. RILEY, *Editor*

The Gas Salesman and the Yardstick

OF LATE we have been frequently reminded from various sources that the Gas Industry is in need of salesmen. Indeed, it might be ventured that some advisers in this regard have gone so far as to insist that the industry is in DIRE need of salesmen. The implication would seem to be that, after a century of somehow floundering about, we have at last approached the dead-line and must perforce begin to look into this business of selling.

It is fairly obvious that we HAVE been selling our product during these first hundred years of our business. Anyone entertaining any doubt as to this assertion should refresh his memory with thought that gas lighting held on for a great many years under the intense pressure of illumination supplied by electrical energy; in fact, a good many years longer than out-and-out economists and engineers expected at the time.

THE CRY FOR salesmen is not monopolized by the Gas Industry; competition has been waxing increasingly more active and the demand for the sales type of individual emanates from all sorts of businesses and industries. And it is a moot question as to whether the supply has kept anywhere near the demand.

Competition has stimulated the business pulse and advertising has certainly given competition an undeniably vigorous boost. Whether such stimulation is real or artificial is aside from the question; the present business line-up shows the existence of feverish competition, and that is the era the gas industry is entering. The situation is not so much that we have never been doing any real selling but rather that competition with other forms of fuel energy and other living factors has grown keener.

THE BIG problem facing the Gas Industry in view of increasing competition is the proper selection of men to cultivate and secure new business for it, and, at the same time, retain the old customers. This choice of salesmen brings with it the hazard of attempting to select such representatives by so-called "scientific" methods.

The matter of present-day employment of salesmen is fraught with such impedimenta as character analysis, memory tests, curve study and other such meaningless nonsense.

Admitted the universal need for salesmen, the Gas Industry would do well to select the same sans the yardstick method and use the always reliable common sense procedure.

The Pittsburgh Holder Explosion

IT IS EVER apparent that man, in his travel through life, is subject to certain untoward hazards over which, at best, he can exercise but a limited control. Accident and disaster, whether caused by human agency or nature itself, have ever been his lot to encounter. And it is not at all a foregone conclusion that the invention and development of machinery and the like have accentuated this condition.

Individuals have been stricken down through the medium of the most trivial and insignificant agencies—indeed, the utter necessities of life have worked disastrously, at times, for their partaker. Accordingly, of the multitude of lessons to be drawn from the lamentable disaster in Pittsburgh, sound and unbiased reasoning can but compel the thought that here occurred an unexplainable quip of fate that cannot be traced to or charged against the century-old method of storing gas in holders. There are too many holders throughout the world and too few holder accidents to warrant any such derogatory conclusion.

The sympathy of the entire industry goes to the Equitable Gas Company and to the Riter-Conley Company for the loss which they and their staffs have suffered. No word of criticism against either can or should or has been raised. Perhaps, somewhere, the human factor failed, as fail it does at times in every line of occupation. If so, it was the mistake of an individual.

The Equitable Gas Company has been diligent in its efforts to alleviate the distress and loss among its unfortunate neighbors. There has been insistence that generous settlement be made, without quibbling as to legal liability; and for this attitude the company cannot be too strongly commended. The financial loss and the cost of such relief combine to a staggering total, but in the end the company will undoubtedly profit by its generous policy and, what is most important of all, will command public appreciation of its good faith and desire to render safe and satisfactory service.

An Outstanding Advance in Gas Engineering

THE gas industry has well taken thought for the morrow as to the problems of house heating and wide fluctuation in gas demand One of the most serious causes for concern has been the fear that with widely fluctuating loads the quality of service will suffer because variation in specific gravity and burner behavior of gas is likely to follow.

Ideal conditions require a coal-gas base load with water gas to make up the requirements of the peak-load period. But this means variation in either heating value or specific gravity, or both; or it may mean an undesired dilution of the base-load coal gas with inerts in order to maintain constancy of gravity and heating value.

The engineers of the industry have seen this problem clearly and now two of these engineers offer the industry a most interesting possibility for meeting the difficulty. Elsewhere in this issue is a paper by L. J. Willien and Louis Stein on the manufacture of low-gravity water gas. Unfortunately space limitations prevented publishing this paper in full in our recent issue with the balance of the A. G. A. convention report. The paper is an outstanding contribution and offers suggestion of further interesting developments. It is commended to the readers of the Journal for careful study.

When the Superintendent Becomes a Foreman

IT IS often hard to determine when the head man in any division of a company should be called superintendent or manager. Often the more dignified term "manager" is avoided in an effort to avoid paying a more dignified salary. On the other hand, there are companies which appear to use the term "manager" for some of their superintendents as a reward to the individual's pride in lieu of adequate salary.

But in few circumstances is it difficult to determine when a superintendent deserves this title and when he has really made himself only a sort of general foreman. The foreman is an active worker, necessarily on the job during the entire period for which he is responsible. He is with his gang at all times. He directs their operations from hour to hour in detail. He is merely a minor executive officer carrying out instructions and seeing that there is no loafing on the job.

Many superintendents exercise their duty in a similar fashion. They come to work at 7.30 in the morning and do not leave at night until the general

night foreman has reported to them and they are sure that all the minor details of the next shift's work have been arranged. One often wonders how long a plant or distribution system with that kind of a superintendent would go on successfully if he were sick or suddenly called out of the city. Certainly such an official has a narrow conception of his job if he is content merely to manage the detail and issue hour-to-hour instructions.

The real superintendent plans his work and issues orders broadly. He counts upon his gang or division foreman for results; and he promotes or "fires" according to results produced. Such a man has a chance to look over his entire field of responsibility at frequent intervals. He is the man with whom should originate suggestions for improvements in equipment or method. He is the one that will discover unnecessary expenses and arrange for their curtailment. Any superintendent who aspires to a managerial position must take such larger view of this job. Otherwise he will remain in fact merely a foreman, regardless of the title which the payroll may carry opposite his name.

Investigate—
Before You Invite

THE Chamber of Commerce of the United States ssues a timely warning to communities against unwarranted effort to attract new industries. This warning is three-fold. A community seeking such prospects is counseled to seek live and growing industries, not those which are about to pass into a decline. It is cautioned as to the need of determining "the character, solvency, and managerial ability" of prospects, "because the community will be called upon to extend them credit and other assistance." And communities are urged to seek only those industries which would move to their territory for sound economic reasons.

The public utility management is and should be active in all projects looking to the expansion of and betterment of local civic affairs. The gas man is, therefore, typically in position to advise regarding this municipal propaganda. No other concern has greater interest in observance of these wise precautions than the gas company. The prospect of immediate increase in gas sales should not blind the management to the need of care and conservatism in municipal propaganda. The national Chamber well says: "One good plant is worth more than many prospects."

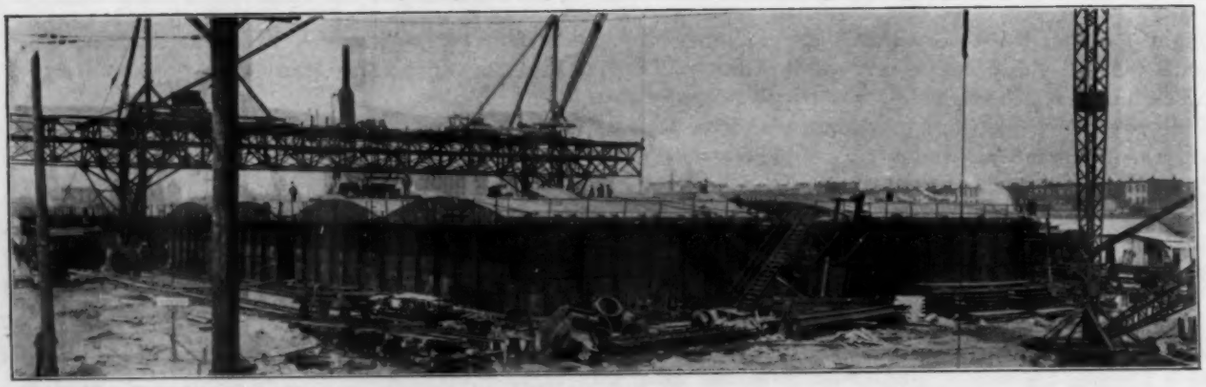
Plant Interconnection,
A Problem for the Gas Man

THE purchase by Insull interests of the Western United Gas and Electric Company again emphasizes that this is the day of consolidations among public utilities. From the standpoint of the public, as well as of the management, this is an important and desirable trend. Rarely can the small utility afford sufficiently skilled management in technical, financial, and other fields to be operated as efficiently as is possible under the direction of a sympathetic holding corporation. And if the holding corporation be really sympathetic in its direction of subsidiaries there is no loss of individuality on the part of the local manager nor neglect of important local considerations.

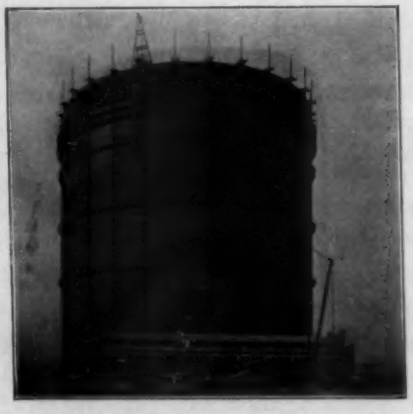
But centralization in great financial structures is not the only important trend of the day that the gas man must study. He must also carefully consider the advantages, as well as the limitations, in centralization of manufacture with interconnection of distribution systems by long-distance high-pressure transmission mains.

A recent interesting example of the great advantage achieved by this form of coordinated effort is found in the area of the Salem and Beverly, Massachusetts, gas companies. These two communities, separated by the Danvers River, had two manufacturing plants about a mile apart. Common ownership of the two properties made it desirable to close one works and manufacture gas for both systems in a single plant. Good engineering work was required to install the requisite transmission main under the river, but this installation was successfully accomplished and at a reasonable total cost, considering the advantages of centralized manufacture.

The gas companies in all adjoining or nearby communities should not wait until the pressure of financial difficulty compels some action to make a study of the advantages of such centralized manufacture. It is not at all necessary that there be common ownership to establish a community of interest in such central manufacturing plant. The trend of the times is toward consolidations and these must be accomplished in many more localities before the industry will find itself upon a wholly sound economic foundation.



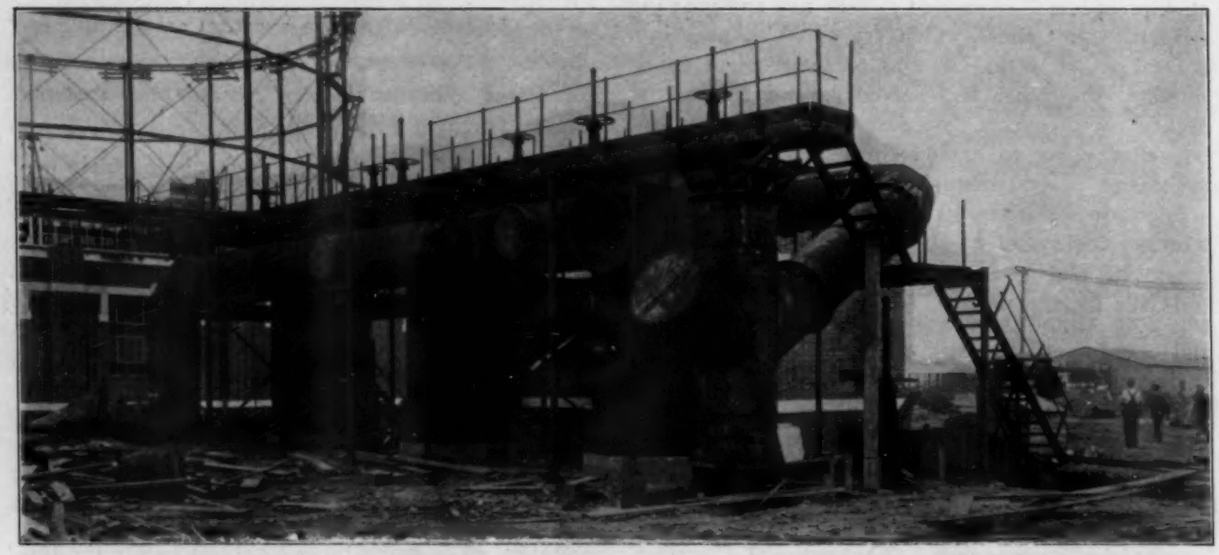
Purifiers in course of construction



Waterless holder

Air blowers in pumping station

Below: Tar precipitators



CONSTRUCTION PROGRESS, NEW GREENPOINT WORKS, BROOKLYN UNION GAS CO. *(SEE PAGE* 33.)

Helping Those Who Help Themselves

By George R. Leighton

Consolidated Gas Company of New York

HEALTH, financial security for dependents and sure assistance in time of disaster. A means to safeguard these three indispensables has a powerful appeal, and when a corporation realizes this and seeks to provide such a safeguard, it has gone a long way toward effecting a long-sought ideal, an efficient, smoothly-running organization. There is always the emergency, inevitable but unexpected, which the income cannot cover and which must be faced. Somewhere in the back of the employee's mind the dread of this emergency is forever present, the still, small fear that dulls the fine cutting edge of his working mind, and so much the more retards the speed of the organization.

The ever-increasing interest in old-age pensions, workmen's compensation and accident prevention testifies to the importance that these problems are assuming in the minds of the public, the employer and the employee. More and more the employer, realizing the necessity of solving the problem, is taking active steps toward that end, and medical and relief departments, finding their place in thousands of corporations, are constantly enlarging their field of action.

In work of this type the Mutual Aid Society of the Consolidated Gas Company of New York has accomplished much and has proven itself successful far beyond the expectations of its founders. Early in the field, the Society, since its inception in 1891, has steadily grown in influence and has made for itself a secure place in the confidence of its members.

One Hundred Per Cent Enrolled

Although membership is voluntary, practically 100 per cent of those eligible to membership are enrolled, which is limited to those who have been in the employ of the Companies for three months or more. The Society now counts over 8,900 as members.

In the beginning, provision of life insurance was the principal interest of the Society, but in the thirty-six years since that time, medical and dental service, hospital care, welfare work and a sick benefit fund have caused its sphere of influence to broaden constantly and to intrench itself securely in Company affairs.

One of the prime reasons for its success is found in its uncompromising independence. Many a co-operative society has been hindered, badgered, and all but defeated in its aims by an attitude of paternalism on the part of those higher up to superintend and carry out aid and relief policies without consulting those who are to receive the benefit of the society's work. Actually, of course, the largest benefit in the end accrues to the company, and the far-sighted employer who realizes this and doesn't attempt to force the issue will get the most results. If the employee feels that he is being patronized, the chances are he won't have much affection or respect for those who are doing the medical and relief work which he needs.

So successfuly has the Mutual Aid Society avoided this pitfall that its members bring in problems of every conceivable nature, confident that their difficulties will be solved. Family tragedies, someone in the clutches of a loan shark, grievances about a job—over and over again situations of this sort are reviewed by the Society and advice and assistance given. No more convincing evidence of the success of the Society's efforts could be given than in cases of this sort.

Service Is Thorough

The medical service in all its branches is extremely thorough. Three dispensaries, outfitted with the most modern and up-to-date equipment, including inhalators, etc., are maintained by the Society, and a fourth is about to be opened.

These dispensaries, situated at different points throughout the city, offer facilities for complete medical examination and diagnosis, care of emergency cases and general oversight of health conditions. Medicines prescribed are from the Society's pharmacy, presided over by registered pharmacists in the Society's employ. Employees may be examined at one of these dispensaries or, if they wish, receive medical attention in their own homes from one of the organization's nine visiting physicians.

Some idea of the immensity of this service may be gathered from the fact that 53,741 free medical treatments were given to members during 1926. This is equivalent to 147 persons treated every day of the year, and represents an increase of 12.4 per cent over the work of the preceding year.

Not only dispensary and home treatments are provided for, but hospital care as well. Last year 206 members of the Society were given treatment in various hospitals, and 1,570 employees received dental care in one of the several offices maintained by the Society. The tooth extraction bill alone amounted to several thousand dollars. Seventeen hundred treatments were given by the Society's oculists.

An Interesting Example

One of the dispensaries offers an interesting example of how exhaustive the work of the Society can be. There all laboratory work concerned with physical examination is done on the spot, such as

the urinalysis and blood tests, and everything is accomplished without having to move outside the dispensary.

More than this, it conducts a good deal of independent research, much of it suggested by cases under observation. On one occasion the dispensary was called upon to treat a case of virulent skin disease which had failed to respond to prolonged hospital treatment elsewhere. Close examination, followed by carefully charted experiment, finally solved the problem and brought about a cure.

Similar cases could be cited over and over again to show how vitally important the Society's work has become. The closest supervision is exercised over these departments, daily reports from the physicians themselves and various checkups keeping the Society informed and helping to maintain its high standard.

Left—The Society's newest dispensary where part of the last year's 50,000 treatments were given. Below—One of the Society's pharmacies.

The problem of obtaining proper and adequate convalescent care for sick and injured employees requiring a period of rest, fresh air and sunshine before returning to active duty engaged attention during the year. After considering a number of sites, a tract of 500 acres in Dutchess County, New York, was finally selected as the most suitable for the purpose. Ideally situated, with the buildings remodeled, the farm has so far proven a great success and promises to so continue.

To the sick benefit fund, carried on for the assistance of the hourly-paid employees only, the Consolidated Gas Company contributes dollar for dollar with the Society. This fund takes care of the worker's family during his illness by the payment of 80 per cent of his salary up to a period of six months. The amount paid last year from this fund was $108,000, the money going to 1,485 persons, 37 of whom were ill for the entire six months. Dues of approximately one per cent for each $1.20 earned are required for one to become eligible to this fund, all other privileges of the Society being available to any member in return for a small weekly sum.

The Mutual Aid Society does not close its work with sending a physician and a check, but it also sends to the hospital or to the home a member of its welfare staff, which consists of three experienced workers. These welfare workers, who last year made more than 5,000 visits, not only carry with them the personal interest of the Society, but find the additional needs which many times are wholly outside the Society's regular benefits.

It is for just such cases that the relief fund has been created. This fund, maintained chiefly by the profits resulting from an annual dance and outing, is a real friend in need. Disaster overtakes a member, perhaps he is burned out by fire. Here the Society steps in and is able to help the member in starting anew. Dozens of cases have found ready assistance from this source.

Life insurance is still one of the most important aspects of the Society's work, as it was in 1891. At that time, with a membership of 200, the Society offered $300 worth of insurance for a nominal fee. Gradually expanding this feature, insurance up to $1,000 was provided for, until finally last year it was made possible for members to obtain insurance equivalent to their year's salary at a very low rate. The first $1,000 of insurance, which was formerly the total obtainable, is secured automatically through the weekly dues, the remainder by a sliding scale of a few more cents.

The value to the members of this increase can be seen readily from the fact that, while the organization in 1925, with ninety-nine deaths, paid out only $99,000, the past year saw disbursements of $128,000 to the beneficiaries of ninety-six members. Seven hundred thousand dollars in insurance alone has been paid out by the Society during the thirty-six years of its existence.

All of these activities are under the supervision of

a board of managers, twenty in number, of whom nineteen are elected by the members of the Society and one appointed by the Company. This board of managers, far from functioning simply as an advisory body, not only elects from its members the president, vice-president, secretary and treasurer, who exercise the executive power, but the various committees in active charge of the Society's work, finance, membership, relief, insurance, medical service, publicity and entertainment, are also made up of board members. The committee on publicity is especially active and does its work unusually well, made up, as it is, of the chairmen of the other committees and under the direction of the vice-president in charge of this work.

Primary Object of Social Activities

Three entertainments are given during the year by the Society, a ball, smoker and an annual outing, and even these are primarily to raise money for the relief fund. This entertainment feature has been carefully watched and restricted, lest any purely social trend should interfere with the Society's more serious work. This again strengthens the members' confidence in the organization and gives an assurance that its resources are reserved for more vital and insistent demands.

Has the Society realized its aim? A neither mute nor inglorious record has demonstrated into how great a power an employee's organization, when given elbow room, can grow. The Mutual Aid Society gets busy after three months and stays busy. In times of illness and distress thousands of dollars have been saved by employees through the efforts of the Society, and new courage and determination have been brought to life again in those who, but for this ready assistance, might have gone under.

No public utility can hope to succeed unless the high level of its service is constantly maintained; and, indispensable to the realization of this objective, is the enthusiasm, the morale and the esprit de corps of the utility organization itself. The Consolidated Gas Company and its affiliated New York City gas companies have realized this and have given unstintedly in labor and money to achieve that end.

In safety education the Company is at present perfecting its plans and equipment, and cannot yet, in this experimental stage, give adequate details concerning the scope of its work. But the Mutual Aid Society is a fait accompli, an actuality, long since grown beyond the stage of experiment.

Spending Habits of American Cities

The first adequate basis for a comparison of the spending habits of American cities is afforded by the completion of the governmental distribution censuses of Denver and Syracuse, the results of which were submitted by the Committee on Business Figures at the recent meeting of the directors and national councillors of the Chamber of Commerce of the United States.

Accurate statistical pictures of the flow of commodities in three typical American cities—Baltimore, Denver and Syracuse—show strikingly large expenditures in Syracuse and Denver for automobiles and gasoline, compared with Baltimore.

Nearly 17 cents of the retail dollar in Syracuse and 14 cents of the Denver dollar went for this purpose, compared with a little less than ten cents of the Baltimore dollar.

For the three cities the larger portion of the retail dollar goes for four classes of merchandise—food products, clothing, automobiles and house furnishings.

Denver spends 28 cents for food, 24 cents for clothing, 14 cents for automobiles and 9 cents for house furnishings.

Syracuse spends 27 cents for food, 22 cents for clothing, 17 cents for automobiles and 7 cents for house furnishings.

Baltimore spends 31 cents for food, 20 cents for clothing, 9 cents for automobiles and gasoline and 8 cents for house furnishings.

In Syracuse furniture and house furnishings are crowded out of fourth place by building material and heating supplies. The census also shows that Syracuse spends more for jewelry and millinery than either Baltimore or Denver. In Denver, however, sales of musical instruments and radio equipment, shoes and hosiery were higher than in the other two cities.

The total retail sales in Denver amounted to more than $150,000,000 and the wholesale business $323,000,000. In Syracuse the retail sales aggregated $103,000,000 and the wholesale $128,000,000.

Wide variations are shown in the per capita retail sales. For Denver they were $533, for Syracuse $561 and for Baltimore $456. This variation might be accounted for by the fact that a larger proportion of retail sales in Denver and Syracuse were made to persons outside the city limits.

The feasibility of taking a distribution census of the entire country, to serve as a barometer of consumption and a guide for production, and methods by which business can co-operate in this project, was discussed at the meeting. Secretary Hoover has proposed that the first national census of this kind be taken in 1930.

What the Public Should Demand of the Gas Company

By F. C. Hamilton

Consulting Engineer, Henry L. Doherty Company

HAVING worked for public utility companies for a number of years, I have been irritated time and time and again by demands that the company do this, that and the other thing which was either impossible or impractical. I have watched the glee with which the ordinary politician hops on a demand to which the company cannot accede as a raft on which to float into public office. Because of this I finally made up my mind to see what a real honest-to-goodness demander could ask, providing he had some slight knowledge of the gas business and no motive other than service to the public in the back of his head; so without any offer of fees on behalf of the public and with no loud demand for my services I proceeded to employ myself.

Being now employed by the public, namely, myself, I am going to tell you chaps what I really want and am going to get as much of it as I can out of you.

In the first place, I want perfect service, to which you will reply that there has not been an interruption in the supply of gas you have given me for my gas stove in the last five years, and to which my reply is going to be "Tommy-rot."

Taking Care of Entire Heating Requirements

You have supplied a little bit of gas for my gas stove, but what I wish you to do is to take care of my entire heating requirements and for the following reasons:

I want to take the space in my house which is now devoted to storing coal and make a billiard room of it, and while I would not do it I know some people who might want to enclose it in reinforced concrete and put in a stock of heating liquids.

I paid good money for that space. You can supply me with a heating service that will not take that space in my house and I want you to do it, not only on account of the investment in the space, but for other reasons. I am tired of paying laundry bills for a flock of little youngsters who get all sooty every time they get into the basement. I am tired of having a lot of dark complexioned gentlemen scatter coal all over my lawn. In fact, I am tired of paying tax bills to lay pavements to allow some coal truck to run down the street at twenty miles an hour and push me and my "flivver" out of the way.

In addition, I might as well make a clean job of it by getting rid of the ice wagon, because having curtailed the retail coal sales, the price of ice will go up due to the reduced load factor which the coal and ice men have, and I am going to demand that either you or the electric company give me refrigeration service. Since the water rate in the town I am representing is low and since the gas ice machine apparently is less liable to need service to keep it in operation, I think the gas company ought to render this service.

Other Pet Hates

Having disposed of the coal wagons and the ice wagons, I have two other pet hates; one is the garbage wagon and one is the ash wagon. Your heating service will have disposed of the ash wagon, but while we are on the subject, I want to do a thorough, workmanlike job and I am going to insist that you give me a rate which will allow me to install an incinerator. The incinerator will do away with some of the flies around the house. The removal of the ash wagon will reduce cleaning bills at home and assist in the reduction of the street cleaning bills of the town. The removal of the ice wagons and garbage wagons will also help in the reduction of the city taxes for street paving.

Up to date you have not given service any more than a restaurant could claim to have given me a meal when I have had a cup of consomme. What there is of it is nice, but it is entirely inadequate.

I know you will come right back and say that you will be glad to sell me as much more gas at my present rate as I want to buy, and you will laugh in your sleeve when you say it, because you know I cannot afford to pay the present rate for gas for heating.

Being an intelligent demander with some knowledge of your business, I am going to ask you what your holder cost is? To which you will have to answer that it is twenty-five per cent of your present retail rate. Whereupon I am going to demand that you sell me additional gas I need for heating at what the additional gas would cost you to make.

Saving the Public Money

We will assume that this twenty-five per cent of your present gas rate is 30 cents. I want that additional gas service at 30 cents, and if everybody in town used it, away would go the coal, ice, ash and garbage wagons; down would go my taxes for street improvements; I would have one more room in my house; future small houses could be built more cheaply because of the lack of necessity for large basements, and about half of the cleaning establishments would go out of business. And do not forget that my client, the public, pays for the coal wagons, ice wagons, ash wagons, garbage wagons, pavements and cleaning establishments. I am bound to save them money.

Being the first time you have had a real demander

Presented at the Annual Convention of the Empire State Gas & Electric Association, Lake Placid, N. Y., October 6-7, 1927.

get on your trail, you are going to be nonplussed for a minute. But after you get your breath you are going to come back and say, "Wait a minute, this production cost which you are using as your basis for additional gas did not contain any profit." I know I cannot buy something from you without furnishing some incentive for you to do business with me. I therefore agree to give you a profit, and being a reasonable demander I am going to leave the decision as to a reasonable profit to the public utility commission which is appointed for that purpose and to whose decisions you must submit.

Whereupon, having a little more time to think the situation over, you are going to say, "To get the additional gas for you we are going to have to install additional capacity at our plant because our plant is now built to supply the load which you, representing the public, are now buying. In your particular locality we are supplying 5,000 customers, and if you know so much about our business you ought to know that we have sufficient equipment to make in one day the gas used that day. So now, Mr. Smart-aleck, how much are you going to use in a day?"

I will tell you at once, being all prepared for my attack on you that my town, being located in central New York, had its lowest temperature in the last five years on February 17, 1922, and that that temperature ran from 2 below to 16 above zero, and that I want enough gas to supply the houses of my clients on such a day.

Adequacy of Distribution System

You are not quite as ready with your figures as I am with mine, and after going over it with your engineering department you come back and explain to me that the average of those 25,000 homes will need on that maximum day approximately 5,000 cubic feet, and that the resulting investment which you will have to make in generating equipment is $725 per customer. You have also thought up another objection to put in my way, and that is that your present distribution system was not designed to carry any such amount of gas during any one day and that you will have to strengthen it with feeder lines and will have to increase the size of the services going into my home and the homes of the other 25,000 customers whom I represent, and that that additional investment will run to $50 per customer, and that therefore you will have to earn an additional return of 8 per cent on $775 per customer to cover this whole program of mine.

In my endeavor to catch you asleep, I ask you: "How much per thousand cubic feet will this be over and above the 30 cents?" And you counter with the question of "How many thousand cubic feet is each customer going to use?" Then we come to a deadlock, because I know that the number of thousand cubic feet the customer uses is going to depend on the price he has to pay. I also know that the financial condition of some of my clients is such that they may not be in a position at once to buy this gas heating, refrigerating and incinerating equipment, and I am in no position to guarantee you when they will change from coal to gas. I cannot give you a fixed figure and guarantee it in a way that it will necessarily have to be guaranteed before your bankers will lend you the money to build this $18,125,000 worth of additional plant equipment and expend $1,250,000 on your distribution system.

Your present investment in plant and distribution system in all probability runs about $225 per customer or a total investment of $5,625,000. Adding to this $5,625,000 the $18,125,000 for additional plant equipment and $1,250,000 for additional distribution system, you have a total investment account of approximtaely $25,000,000.

Return Not Exorbitant

But unlike other demanders I do not just call you a "crook" and try to get a competing franchise granted to some fly-by-night operator. I know that you know your business and that for such service as you have given me you have not earned an exorbitant return. I am determined to get that additional service which you can render, and so I advance the following proposition for your consideration to see whether or not we can do the business that we are both anxious to do:

Your plant with the changes that your engineers have made to cover all these heating requirements would supply a total demand of 96 million cubic feet per day with a total investment of $25,000,000. An 8 per cent return on that investment amounts to $2,000,000 annually, so the demand necessitates a fixed charge per hundred cubic feet. You might advance the logical objection that this equipment and these mains must piece by piece and from time to time be replaced to maintain one hundred per cent service, and therefore you ought to have an additional 2 per cent on that investment for replacement. I do appreciate it, of course, but was just waiting to see if you had forgotten it. To this I also add 1 per cent for taxes. Whereupon I have a fixed charge of $2,750,000 per year.

Based on your experience where you have supplied the entire requirements, you have found that the average customer has made an approximately maximum hourly demand of 250 cubic feet, which will mean a maximum hourly demand on this plant of 6,250,000 cubic feet. Distributing the fixed charges in proportion to the demand means a fixed charge of $44 per year for each 100 cubic feet of maximum hourly demand.

Additional Calculations

I come back with the proposition that you offer a rate of 55.2 cents per thousand cubic feet for all customers using 350,000 cubic feet per year, which is made up on the basis that they will demand 200 feet in their maximum hour and I have, therefore, added to the $105, resulting from the 350,000 cubic feet at 30 cents per thousand cubic feet, $88 to cover the 200 feet of demand and divided the total by 350,000 cubic feet; and that to the customer who has a 300 cubic feet demand and uses 600,000 cubic feet you add $132 for demand charges and $180 for additional cost of production at the plant, making a total of $312, or 52 cents per thousand cubic feet.

You at once advance the objection that the customers are going to commence using a little gas in September, more in October and still more in November, and you do not know when they start what they will use in the season, so you come back with the proposition that the man with the 200 foot demand immediately pay you $88 per year and then pay you 30 cents per thousand cubic feet for your gas.

I then make the suggestion to you that you take this fixed charge and divide it into equal monthly installments, which is the basis on which you accumulate your interest and taxes, and allow my customers to pay in that manner and I immediately begin checking against the resulting $7.33 a month to see whether or not the service is worth the cost On the basis of 30 cents per 1,000 cubic feet of gas of 600 B.t.u. content and $12 per ton of 12,000 B.t.u. coal, my cost per heat unit is the same, but I, of course, will get added efficiency from gas as compared with coal. That added efficiency results in a heat unit requirement in gas of approximately 75 per cent of the heat unit requirement in coal. My 200 foot demand customer then using 350,000 cubic feet of gas per year, for which he pays $105, will have secured the heat that would have necessitated an expenditure of $140 for coal, and I can credit $35 in reduced coal bill against the fixed charges that follow the use of gas.

Ash Removal Should Be Credited

The cost of removing ashes and janitor service, whether I hire it done or force my overworked wife to do it, ought to be credited with a further saving of a minimum of $2 per month, which gives me another $24. My ice bill, summer and winter, averages $2.50 per month, so that I have another saving of $30 as an offset. These three items alone total $89 per year and to them I can add some credit for removing of the nuisance of ash man, coal man and garbage man; a credit in the reduction of taxes, and a credit for reduction in traffic congestion caused by these very coal, ice, ash and garbage wagons, and last, but not least, a decided reduction in the necessary laundry and cleaning bills, in which there ought to be an item for reduced expenditures for painting and paper hanging in my home.

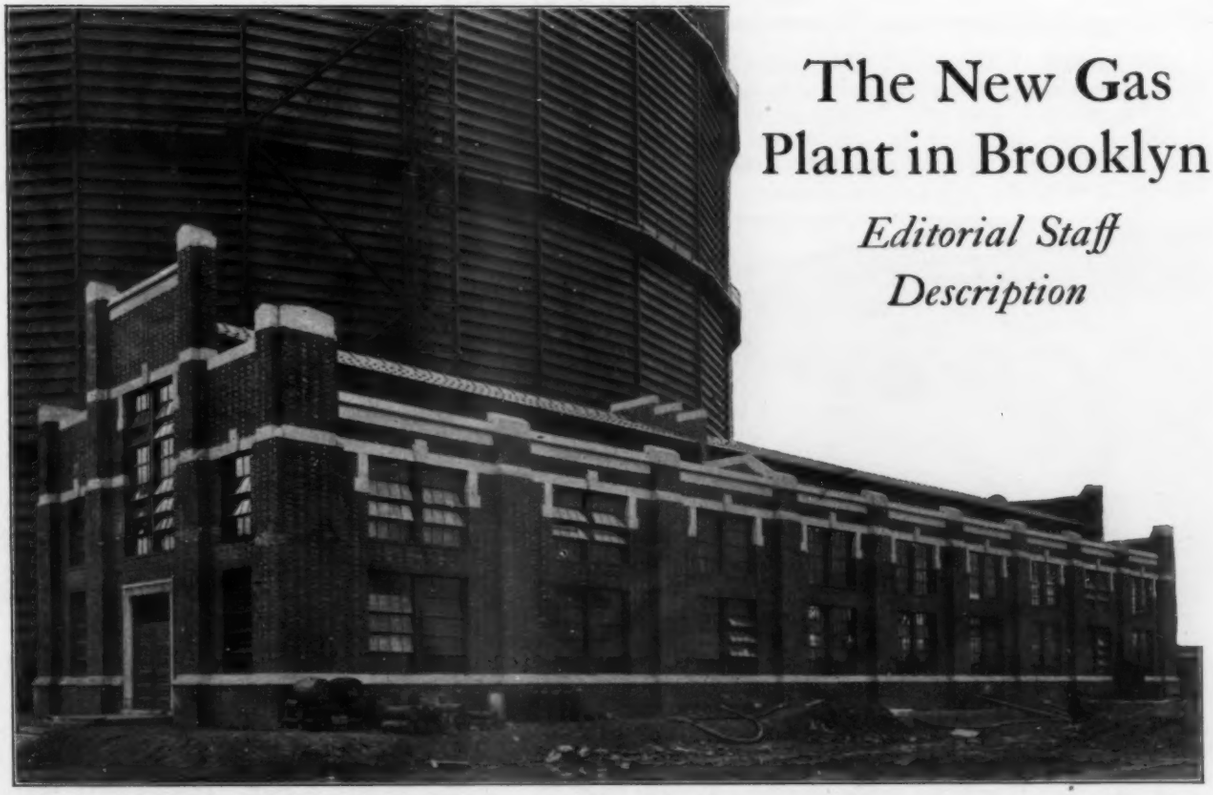
It is at once apparent that my entering into such a contract with you will give me a much cleaner and more comfortable home and will give it to me at a cost very much less than I am now paying.

I am still up against your request that I guarantee what these customers will do in the way of installation of equipment, and when they will do it, but I see no reason why you should not publish this rate and let the customers come on as and when they will, because as you figure it each additional customer pays the additional cost which that customer necessitates and, therefore, whether these customers come on one at a time or a dozen at a time makes no particular difference to you.

In an endeavor to check this proposition from all angles my next question is whether or not any other public utility service is charged for on this basis. To which you reply, that practically all electric current in the United States has been sold under some form of a demand and consumption charge with the exception of lighting for domestic purposes. If you are frank you will admit that in all likelihood the rapidity with which the electric business has grown in comparison with its older brother in the utility service, the gas business, is because of their earlier adoption of a form of rate that equitably assessed as between customers the different costs arising from the demand and consumption. In other words, the electric business very early in the game realized the possibility of reducing rates on good load factor business and developed a rate form that premiumized good load factor and penalized poor load factor.

Convincing the City Authorities

After rechecking the rate which you propose against the various classes of homes and thoroughly convincing myself that this rate will make possible real service from the gas company at a price which the customer can afford, I suggest to you that I will endeavor to get the city council and other city authorities to express their approval of the granting of such a rate, providing you will file the application with the public utility commission which can authorize it. Your lawyers are then asked to prepare an application to the commission, whereupon you very promptly call me over the telephone and in a very discouraged tone of voice tell me that all our work has gone for nothing because of paragraph 6, chapter 898 of the laws of 1923, which prohibits any service charge on behalf of the gas company. I ask you how the electric companies got away with their demand charges, and you explain that this amendment applies to gas companies only and, free of charge, you express to me your private opinion of taking the most essential part of the rate-making power away from the public utility commission, who are equipped to pass intelligently on the subject, and prohibiting the only rate form under which I could get service by a legislative enactment voted for by people who never have spent ten minutes studying the economics back of utility service. I thoroughly agree with you, and, still on my job as a demander, I start out trying to educate the representatives of the people who sit in the State legislature to a point where they will repeal the amendment that keeps me from getting the service I want at a price I can pay through the passing of discriminatory legislation.



The New Gas Plant in Brooklyn

Editorial Staff Description

BROOKLYN, the largest of the boroughs of Greater New York, and one of the greatest industrial centers in the country, is served by a number of gas companies, the largest and most important being the Brooklyn Union Gas Company. Due to the rapid growth of this city, industrially and otherwise, it has been found advisable to anticipate its gas needs by way of projecting and beginning the construction of a huge gas generating plant.

This gigantic undertaking, one unit of which is nearing completion, will constitute, when finished, one of the largest gas works in the world. The plant, which is being built on a large tract of land bordering Newtown Creek, will have an ultimate capacity of two hundred million cubic feet of gas per day.

The nearly completed first unit will have a daily capacity of forty million cubic feet. The additional four units of the same capacity will be added as the need arises.

Plant Covers Large Area

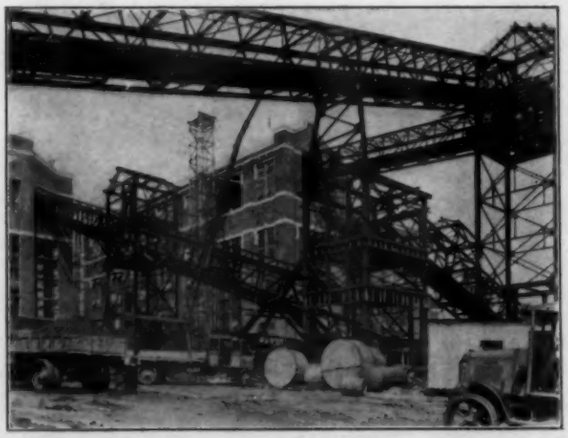
The property on which the plant is being built is one hundred and fifteen acres in extent, and has a frontage of about two thousand feet on Newtown Creek, which is a tributary of the East River. The first unit, which is nearing completion, comprises a twenty million cubic foot water gas plant and a coke oven plant of the same capacity. The plant property was purchased in 1925, and the work was actually started in the latter part of December, 1926, although attention was being given to the project as early as April, 1926. At the time of writing, the water gas and purification parts of the plant are almost completed, while the foundations have been laid for the coke oven plant.

Water Gas Plant

The water gas plant comprises six generators of the Bartlett Hayward type. These generators are twelve feet in diameter with hopper bottoms. This apparatus, together with the auxiliary equipment, is located in a generator house which is of novel and interesting construction. The ground floor of the house is for ash removal purposes only. Trucks can easily drive into the building and stop under the opening in the bottom of the generator, through which the ash is allowed to drop into a suitable bin and thence through an opening in the floor into the trucks. The ash removal problem is therefore simplified to the highest degree.

Each generator set is of the usual three shell type, consisting of a generator, a carburetter and a superheater. Each generator is fitted with a Wickes waste heat boiler of approximately two hundred horsepower. The stoking of the generator is accomplished on the stoking floor, which is directly above the basement floor. The operating floor is the next above and on this are located the regular instrument boards and the automatic operating controls. The automatic control consists of a Kennedy automatic electrically operated runner, which operates the Critchlow hydraulic valves, which in turn operate the different valves on the generator, the entire process being automatic. The charging larry

is also located on this floor. This apparatus is of small type, moving along the floor on rails and stopping before each generator to charge it with coal or coke. The fuel bunkers are located overhead, from which fuel flows through the charging larry into the generators.



Fuel handling structure

The size of the set will be evident from the fact that the dust pocket which is provided in each set is eight feet high and nine feet in diameter. It should also be mentioned that each generator is provided with a hopper for holding the ash. This hopper is located beneath the generator and the ash is removed from this bin into the ash trucks by pulling open a suitable slide valve. The generators are also fitted with a steam accumulator (Smoot type).

Handling the Fuel

The fuel enters the generator house at its top by a system of steel supported overhead conveyors. The generator house is provided with a lean-to, in the first floor of which there are located the turbine-driven Sturtevant blowers for the generators On the second floor are located the various offices of the operating superintendents of the water gas house, as well as the locker, toilet and wash rooms for the men.

The main which collects the gas from the water gas set runs to a relief holder of one million cubic feet capacity. This holder is of the usual lift type and the collecting main is seventy inches in diameter.

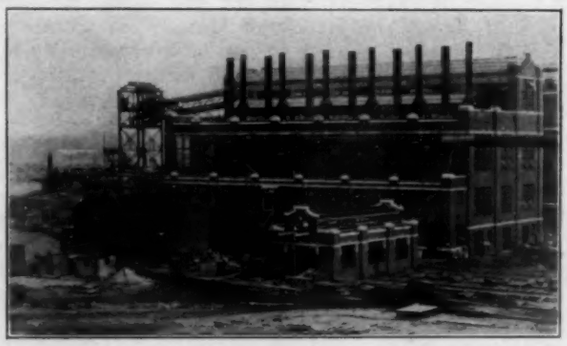
The water gas plant will be operated on the back run principle and a 550 B.t.u. gas will be obtained after carburetting with the aid of gas oil. Exhaust steam will be used in the gas-making process. The fuel used will be coke, which will be made in the coke oven plant. Suitable arrangements will eventually be provided for moving this coke to the water gas works. At the present time a means is provided for moving coke from a coke pile on the ground to the generators.

The pump house, which is near the generator house, contains the various seal water, tar and oil pumps. The separating tanks are located in a pit to the right of the pump house. Other separating tanks are located on the other side of the building.

The purification system of the plant is of the ordinary type, with the exception of the Cottrell precipitators. The condensers are of the Bartlett Hayward type. They are four in number. Each of these condensers is of five million cubic feet capacity. They are regulation cast iron, tubed, open condensers, which are arranged for use with salt water. The canal water is directly pumped into these open condensers.

Removing Tar From Gas

There are no scrubbers in the system, their place being taken by three Cottrell electric tar precipitators. The Cottrell precipitator removes the tar fog in gas by means of the corona discharge, which takes place in tube electrodes, down which the precipitated tar flows to collect in the bottom, from which it is removed to the tar storage tanks, after the water has been allowed to settle out in settling tanks. The voltage of the current used in these precipitators is 75,000 volts, and the magnitude of this voltage has introduced two interesting features in the construction and operation of the apparatus. The structural feature is a porcelain apron support for the busbars, in which porcelain insulators are located in lateral boxes, in which a steam coil is arranged to prevent the collected tar from hardening on the surface of the insulators and thus causing a short circuit.



Generator house

The operating feature is in the nature of an interlocking system, whereby it is not possible to open any door of the apparatus and thus come in contact with a high tension current, unless a series of locks has been manipulated one after the other, each successive lock not being opened until the lock preceding it in the series is first opened. In other words, unless the operator starts opening or closing his locks in succession, it is impossible to arrive at the final lock which opens the door in the precipitator. It is not possible to skip any lock in the series.

An exhauster house is provided for three exhausters of the Connersville type. They are driven

by Harrisburg Foundry and Machine Works steam engines.

Purifiers

There are eighteen purifier boxes, six of which are for purifying water gas and the remaining twelve for treating the coal gas. The boxes are located close together and the same crane that serves the water gas boxes also serves the coal gas boxes. The boxes are forty by fifty feet in area by thirteen feet three inches deep. The twelve coke oven gas purifiers are connected in series of four each. The boxes are designed for two five-foot layers of oxide. They are fitted with chain valves, so that the gas can be put in the middle of the oxide and taken out from the top and bottom, or put in at the top and bottom of the oxide and taken out from the middle. Each box will hold from eighteen to twenty thousand bushels of oxide.

There are two six hundred thousand gallon tanks for the storage of gas oil which is used in making the carburetted water gas. These are provided with concrete enclosures and suitable fire walls. There are also two storage tanks for the tar recovered from the Cottrell precipitators; one with a capacity of 550,000 gallons and the other 400,000 gallons.

In the meter house there are four positive type Connersville station meters. Both the coke oven gas and the water gas are metered in this building.

View of purifiers

Situated on the works are the necessary shops for making repairs, such as machine shops, blacksmith shops and the like. These are equipped with all modern machinery, there being, for example, a ten-ton Shaw crane in the machine shop. There is also a building for storing parts, piping and various other materials.

Waterless Gas Holder

In the Greenpoint plant the gas holder commands special attention. It is a fifteen million cubic foot holder of the waterless Bartlett-Hayward type. The holder is four hundred feet high and two hundred feet in diameter. A cupola is provided for ventilating purposes at the top, rising to a height of forty feet. The holder is provided with outside and inside elevators. There is also an emergency lift in the inside of the holder, which is served with fifteen tar pumps that maintain a steady circulation of the tar sealing liquid through the holder.

Interior of booster room

The foundation of the holder consists of a pad supported by composite wood and concrete piles. The piers for the columns are twelve feet deep. There are eight motor driven valves located around the holder on the ground. Two sixty-inch pipes lead from the holder on the south side and two similarly on the north side. The gas can be pumped into the holder through one set of pipes and drawn from it and passed into the distribution system through the other set, each set being usable for either purpose. Telephone connection is provided with the top of the holder and a telltale is located on the outside which shows in millions of cubic feet the quantity of gas in the holder.

Pumping Equipment

The pumping station is provided with four General Electric centrifugal boosters, with a capacity of 800,000 cubic feet of gas per hour each, up to a pressure of sixteen pounds per square inch, if necessary. Directly connected to the booster is a General Electric 1,000-horsepower slip ring motor adaptable to varying speeds and pressure requirements. The booster motors are ventilated by means of ventilating fans which draw air from the exterior of the building. There are three Buffalo Forge Company blowers and three Cooling and Air Conditioning Co. air washers. The air is first warmed, then passed through the washers and then through the blowers into the motors. The bearings of the boosters are water-cooled and two pumps are provided for maintaining the water in circulation.

The construction of the power house is such that the firing of the boilers is carried out on an upper story, the ground floor being entirely clear of apparatus and serving as an ash removal floor. The trucks into which the ash is dumped from the boilers drive directly into the building and stop at the proper points under the chutes, down which the ash is allowed to drop. The work of ash removal is therefore reduced to a minimum.

The Boilers

There are six boilers in all. Three of these boilers are fired with hard coal by means of automatic stokers of the Combustion Engineering Co. type. The other three boilers are fired with the tar that is recovered from the gas in the Cottrell precipitators. Suitable pumps are provided for pumping this tar, after the water has been allowed to settle out, into the burners in these boilers. All the boilers are of the inclined water tube Babcock and Wilcox type and are provided with superheaters. They are each of six hundred horsepower capacity. The boilers are all induced draft boilers and the preheated air is supplied for combustion purposes over the stokers.

Handling the Fuel

One of the most interesting features in the boiler house is the method used for handling the fuel into and out of the boilers. At the very top of the building there is located a concrete bunker which runs the length of the building. Coal is fed into this bunker from the coal pile on the ground by means of a system of conveyors. The coal drops by gravity from this bunker through chutes into the feed end of the mechanical stoker. The ash drops down by gravity and is carried away in trucks, as has been mentioned above. Hand labor is therefore reduced to an absolute minimum in this boiler house.

The first unit of the gas works will also have a twenty million cubic foot coke oven plant of the Koppers type. This plant will consist of two batteries of thirty-seven ovens each. Each oven will have a cubic capacity of 545 cubic feet. The throughput of the oven wil be 12.8 net tons of coal at the rate of 47 pounds per cubic foot. The chambers will be thirteen feet high, fourteen inches wide, with one and one-half inch taper, and 40 feet 8 inches long, face to face with doors. The ovens will be fired both with producer gas and coal gas. The coke produced will be quenched by the wet method and will serve as fuel in the water gas generators.

The incoming and outgoing fuel is to be handled by means of three Brown bridges (Hoisting Machinery Co.), 240 feet span, consisting of a front bridge and two rear bridges for restoring. The capacity will be 250 to 300 tons of coal per hour each.

The plant is a marvel of co-ordination of units and the layout of the buildings, as well as the design of the machinery and the building construction, are of the very latest in gas manufacturing developments.

The Story of Heating the Home With Gas

By L. N. Yetter

Commercial Manager, Atlantic City Gas Company

IN MAKING a comparison of the various types of heating installations there are three things to be considered; first, the adaptability of the fuel; second, the cost of installation; third, the actual cost of operation. Gas is given the first place almost without question for ease and closeness of control, cleanliness, convenience, and comfort; it makes no noise, is clean and odorless, and can be regulated to any desired temperature almost to a degree, with a minimum of time and effort. The installation cost will compare favorably with that of other types of heaters, and the operating cost also will compare favorably with other fuels if used in accordance with the directions of the gas company. The installation itself will be much more sightly, placing the heater room on about an equal with the kitchen, in many cases, the heater room being furnished and occupied.

Many prospects, on the first interview, are a bit skeptical about the use of gas for heating, because they have heard from other sources that it is rather expensive. There are several reasons for this, the two most important being that it is a human failing for one person to want another to feel that he is enjoying something the other cannot afford; and the other reason is that a person receiving his December, January and February bills, which are the three largest during the heating period, is likely to impress the other fellow with the high cost, neglecting to mention that all the other bills will be much less, and that any one of these months would be about one-fifth of the total bill for the season. (We have about five thousand degree days during the heating period in this territory.) It was to combat these factors that the accompanying summary was evolved.

This partial list of consumers was made up with the object in mind of having representative people and houses on the list, both as to their standing in the community and the size of their installation, with the operating costs ranging from fifty dollars for spring and fall heating up to one thousand dollars for the entire season. Thus, no matter where

the prospect lived, or how large or small his house, there was always someone with whom to compare the conditions. The consent of the people concerned was granted without hesitation, and the "ad" was inserted in the local papers, the Chamber of Commerce Bulletin, and other mediums.

The response was prompt and gratifying, and the "ad" proved to have the most "pull' of any heating advertising ever attempted in Atlantic City. It is estimated that from the time of the original insertion of the "ad" up to this writing there were about seventy-five inquiries directly traceable to the "ad," of which about twelve resulted in orders for new installations.

The use of the list did not stop with newspaper insertion, for one thousand copies were printed for supplementary use. These were enclosed with letters descriptive of the advantages of gas for house heating, and folders of the boiler and automatic water heater, and a gas-fired refrigerator. These letters were sent to members of all civic and luncheon clubs, and also to bank directors, physicians, and the regular prospect list. The solicitors were provided with a supply of these sheets, and used them in their direct canvassing. The salesman who made the heating surveys and follow-ups also used them, and found them very helpful in substantiating his estimates on operating costs by comparing the prospects' houses with similar ones on the list.

HEATING THE HOME WITH GAS

THIS SUMMARY IS POSITIVE PROOF THAT HEATING THE HOME WITH GAS IS PRACTICAL AND ECONOMICAL

NAME	ADDRESS	GAS FURNACE Size	Type	Sq. Ft. Rad.	GAS CONSUMED BY MONTHS Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr'l	May	TOTAL GAS USED	TOTAL AMOUNT PAID
L. D. Algar	15 S. Jaakson	5W3	Water	690.0	5.4	25.7	87.5	96.5	102.3	72.1	70.7	53.7	22.6	506.5	$465.85
Benj. Bacharach	106 St. Charles	9W4	"	1,264.0	3.9	74.7	94.8	140.0	110.1	96.1	96.5	76.9	40.1	739.1	665.19
James Burt	206 Victoria	4S4	Steam	226.0	...	17.9	51.4	55.2	47.5	35.3	36.6	26.0	13.6	283.5	237.15
John Burt	200 Pacific	5W3	Water	1,789.0	...	52.7	68.9	79.6	87.8	69.2	90.7	84.4	37.9	571.2	514.08
M. A. Devine	18 S. Brighton	7W4	"	1,163.0	...	27.9	52.4	96.5	103.3	71.9	77.6	32.8	27.6	490.0	441.00
Chas. A. Eaton	105 N. LaCiede	3W3	"	369.0	...	...	28.1	53.3	63.3	49.1	43.3	29.2	12.4	283.7	255.33
M. I. Fischman	23 N. Bartram	6C8	"	894.0	1.8	25.1	50.1	86.7	91.5	62.2	59.1	49.3	20.9	446.7	402.03
Carlton Godfrey	34 S. Indiana	8C3	"	1,293.0	...	16.9	84.0	121.4	105.4	59.5	65.4	62.3	7.3	499.2	449.28
Kathlie Gubert	152 N. New Hampshire	...	"	250.0	...	...	33.1	...	38.4	...	55.6	14.8	...	141.7	127.53
H. W. Hemphill	20 S. Raleigh	3S	Steam	457.0	...	27.9	61.3	107.5	109.3	76.8	65.4	50.0	8.5	503.4	455.76
J. A. Hillman	33 S. Elberon	5W	Water	895.0	...	37.4	74.4	103.8	112.9	82.5	80.6	54.8	23.9	570.3	512.27
J. S. Hyman	130 N. Maine	6W3	"	975.0	0.4	51.5	48.3	101.0	104.5	81.8	73.8	58.4	6.5	526.2	473.68
John Jolley, Jr.	14 S. LaCiede	9W4	"	1,440.0	...	57.9	73.8	152.2	153.6	112.2	109.0	91.9	34.1	784.7	706.23
Wm. E. Kissinger	104 Temple Garden	3W3	"	432.0	...	...	...	35.6	41.7	38.2	29.0	28.2	4.5	178.2	160.38
Ida H. Love	130 Caspian	3C3	"	443.0	...	10.3	22.6	...	...	...	18.7	17.6	...	69.2	62.22
Wm. B. Leaf	4303 Atlantic	8C3	"	1,231.0	...	25.8	84.3	90.3	90.4	63.1	61.0	51.1	9.1	445.1	400.59
Jos. Levy	26 S. Stanton	11W4	"	1,513.0	...	18.5	89.7	149.8	158.7	118.8	121.6	74.3	...	...	...
Guy Leong	115 Inlet	0G60	"	506.0	...	...	5.1	13.1	53.2	35.4	40.8	32.0	14.5	194.1	174.69
James McLaughlin	4 N. Montpelier	6W3	"	794.0	...	17.6	56.9	69.5	60.7	51.8	40.7	44.2	23.6	365.4	328.86
F. W. MacNeill	906 Beach	3W	"	912.0	...	23.2	45.9	81.2	83.6	56.0	54.7	41.2	21.5	407.3	366.57
Lydia Palmer	53 N. Harrisburg	8C3	"	1,700.0	...	...	43.3	113.6	111.1	64.7	56.1	36.6	8.1	433.5	390.15
Samuel Salasin	511 Pacific	8W3	"	1,050.0	...	27.1	82.2	93.0	87.2	58.0	57.2	39.9	13.8	498.4	385.56
Lester Selgel	120 N. Hartford	4W4	"	621.0	...	16.7	57.4	68.2	49.7	49.0	45.6	38.5	20.1	324.0	291.60
Albert Stephany	136 N. Windsor	5C3	"	656.0	...	26.6	24.4	...	110.4	38.9	38.8	27.9	14.9	277.9	251.91
Abe Weintraub	24 S. Windsor	8W3	"	1,158.0	5.5	30.9	67.9	111.2	115.2	80.7	76.3	62.7	29.7	580.1	522.09
Mrs. J. S. Whillding	2 S. Delancey	9W4	"	1,400.0	...	34.4	69.4	119.0	121.8	78.6	75.4	56.9	7.4	562.9	506.61
Frank Errico	Argyle and Atlantic	8W3	"	1,095.0	...	38.3	76.7	115.1	122.2	83.7	80.8	63.1	23.3	603.2	542.88
J. D. Farrington	Douglas and Atlantic	3C3	"	315.0	0.8	14.7	25.4	44.8	38.7	30.5	29.8	23.0	-9.8	216.9	195.21
Mrs. Farrington	12 N. Nassau	5W3	"	737.0	...	...	...	56.2	60.6	87.6	33.5	...	...	237.9	214.11
C. A. Frank	12 S. Barclay	6C3	"	821.0	1.9	26.2	...	...	...	87.7	...	94.7	18.9	229.4	206.46
M. H. Goodin	11 N. Nassau	4C3	"	515.0	3.4	19.1	35.5	76.5	58.7	49.0	46.1	34.6	13.6	338.5	300.15
M. A. Hallowell	Sumner and Ventnor	8S	Steam	750.0	...	...	...	...	132.6	86.0	103.9	101.9	12.5	443.6	399.51
John Hurst	20 S. Argyle	6C3	Water	877.0	...	30.2	49.9	101.3	71.3	...	126.1	43.2	...	422.0	379.80
Mrs. A. E. Jardine	33rd Ave., Longport	8W3	"	1,090.0	...	5.0	47.8	84.7	67.1	59.2	60.8	45.3	4.0	373.6	338.14
R. L. O'Keefe	1 E. Drive	3W4	"	1,100.0	...	55.7	57.2	107.9	112.4	81.7	77.9	63.5	25.8	581.8	523.62
Harry Robinson	11 N. Osborne	6	"	1,053.0	...	...	29.4	118.0	94.1	79.2	79.9	61.4	27.6	489.8	440.64
Theo. Senasman	117 N. Osborne	5W	"	633.0	...	14.4	52.5	104.6	90.4	69.8	70.1	52.7	17.1	471.6	424.44
C. C. Widdis, Jr.	109 N. Sumner	4C3	"	534.0	...	6.9	26.9	89.9	49.3	33.3	38.6	27.5	4.5	249.9	224.91
J. J. Campbell	101 S. Dorset	9W4	"	1,610.0	1.9	38.5	95.6	159.6	163.1	113.7	109.2	84.6	28.5	796.7	716.13
Frank Chambers	5000 Atlantic	4W4	"	874.0	...	16.2	36.1	79.6	55.9	48.1	42.6	32.4	10.7	322.6	290.34
F. E. Croasdale	10 N. Victoria	7W3	"	1,050.0	...	23.5	59.1	104.7	43.7	41.6	74.6	53.5	29.2	429.9	386.91
E. T. Duval	12 S. Roxborough	6W3	"	1,200.0	...	13.2	40.6	62.3	...	...	...	...	...	106.1	95.49
S. B. Dobbs	6601 Boardwalk	11W4	"	1,966.0	...	...	...	...	...	...	...	...	89.5	89.5	83.55
A. C. Ekholm	Wyoming & Winchester	8	"	915.0	1.6	50.8	37.2	79.3	67.4	62.1	53.0	34.6	4.2	390.2	351.18
V. S. Fisher	17 S. Somerset	8C3	"	942.0	5.1	35.5	65.1	112.4	107.4	76.3	82.5	63.4	23.5	576.2	518.58
W. L. Geller	2 S. Baltimore	7W4	"	1,000.0	...	33.0	42.7	85.7	97.5	70.1	55.2	58.3	14.3	456.8	412.92
H. L. Godshall	1 N. Oxford	7W3	"	944.4	...	17.7	61.2	112.3	113.7	80.9	81.4	63.1	27.9	560.2	504.08
Ewald Grobel	21 S. Swarthmore	7W3	"	663.0	...	16.7	39.3	76.3	66.4	61.6	47.7	36.1	11.4	347.5	312.75
M. M. Harris	20 S. Hillside	7W3	"	767.0	...	17.6	43.8	94.6	78.7	68.8	57.5	43.1	19.7	410.2	369.18
Agnes A. Klauder	9 N. Swarthmore	6W4	"	924.4	...	19.4	39.4	74.6	69.8	45.2	45.2	34.0	7.1	325.7	293.13
R. W. Mixner	103 S. Fredericksburg	6W3	"	850.0	...	22.4	50.9	88.6	99.1	50.4	45.9	41.5	7.8	406.6	365.94
Herman Olanoff	6315 Monmouth	4W4	"	862.0	...	...	35.4	55.6	61.2	44.4	42.3	34.6	15.6	289.1	260.19
Chas. Pryor	107 S. Fredericksburg	7W4	"	1,164.0	...	...	...	168.5	74.3	80.0	97.8	63.8	7.9	494.0	444.60
Thos. Randow	11 N. Baltimore	4S3	Steam	230.0	...	8.8	43.2	71.5	73.4	...	87.8	28.4	8.1	320.9	288.81
W. F. Sauten	103 S. Baton Rouge	4S	"	837.5	7.1	29.4	...	...	...	...	...	...	46.8	83.4	75.06
Wilson Senseman	2 S. Suffolk	7W4	Water	1,141.0	3.4	37.3	17.7	57.0	135.4	88.7	87.8	63.9	39.3	532.8	479.25
F. J. Siracusa	104 S. Dudley	3G11	Vapor	2,500.0	9.5	87.2	143.0	178.1	285.3	163.0	178.8	145.0	78.6	1,218.5	1,096.65
H. E. Smith	6003 Ventnor	8W3	Water	1,190.0	1.2	23.8	55.4	108.7	115.0	74.9	74.3	58.5	21.2	533.0	479.70
John Stinson	7405 Atlantic	7W3	"	1,079.0	...	25.0	66.0	95.8	99.3	65.7	60.7	46.4	16.1	475.0	427.50
W. Chandler Stewart	101 S. Baltimore	8C3	"	902.0	4.9	29.0	61.6	114.0	93.4	75.1	72.7	46.4	24.3	521.4	469.25
H. S. Hodson	2 S. Derby	9W4	"	1,710.0	7.9	35.3	67.7	115.7	127.8	89.7	88.1	57.1	31.6	620.3	558.27
A. L. Williams	4925 Ventnor	8C3	"	1,106.0	...	24.3	57.2	112.2	114.7	89.7	78.1	57.1	8.8	538.8	484.92

THE ABOVE FIGURES SHOW THE ACTUAL GAS USED AND THE AMOUNT PAID BY EACH CUSTOMER DURING THE ENTIRE HEATING PERIOD. THIS SERVICE IS WITHIN REACH OF EVERY HOME OWNER. PREPARE NOW FOR THE COMING SEASON. MAY WE BE FAVORED WITH THE OPPORTUNITY OF FURNISHING YOU WITH FURTHER INFORMATION - - SUCH AS COST OF INSTALLATION AND OPERATION.

COMMERCIAL DEPARTMENT

ATLANTIC CITY GAS COMPANY

MICHIGAN AND ATLANTIC AVENUES

3625 TELEPHONE MARINE 3625

Actual Size of Above Newspaper Ad 10" x 15". *Aug* 1*st* 24*th*, 1927.

The showroom display consisted of three boilers, one located where a person coming in the door could not help but see it. This boiler was equipped with a thermostat, and assembled as it would be in actual use. A placard bearing the legend "Gas-Fired Furnace—For the Home—Controlled from the Living Room," was placed across the front of the boiler. Near the door, where a person leaving the building would see it, was located another boiler. These boilers were used for demonstrations. Another boiler was placed in the window, also bearing a placard. Other attractive cards were grouped around the boiler. Across the top of the three front windows were pasted three large posters, three feet high, and totaling twenty-eight feet wide. These bore three reproductions of paintings used in one of the boiler company's national advertising campaigns and also a slogan popularized by them.

Thus the whole campaign very effectively tied in the national advertising, the local advertising, window and showroom display with the direct sales effort of the organization, and the sheet bearing the names and amounts paid formed the nucleus for the entire work.

Commercial men who have had experience in selling gas heating will appreciate the appeal of this "ad," for gas heating almost always boils down to the question of operating cost, and with the modern business man who is considering automatic heating for his home facts and figures are more effective than oratory. The writer has tried almost all of the methods of advertising, and although it is quite hard to measure the direct results of newspaper advertising in dollars and cents, it can be said that this particular "ad" gave the best results of any he has used for such a highly specialized service as house heating by gas.

The Control of Salt Water in Natural Gas Wells

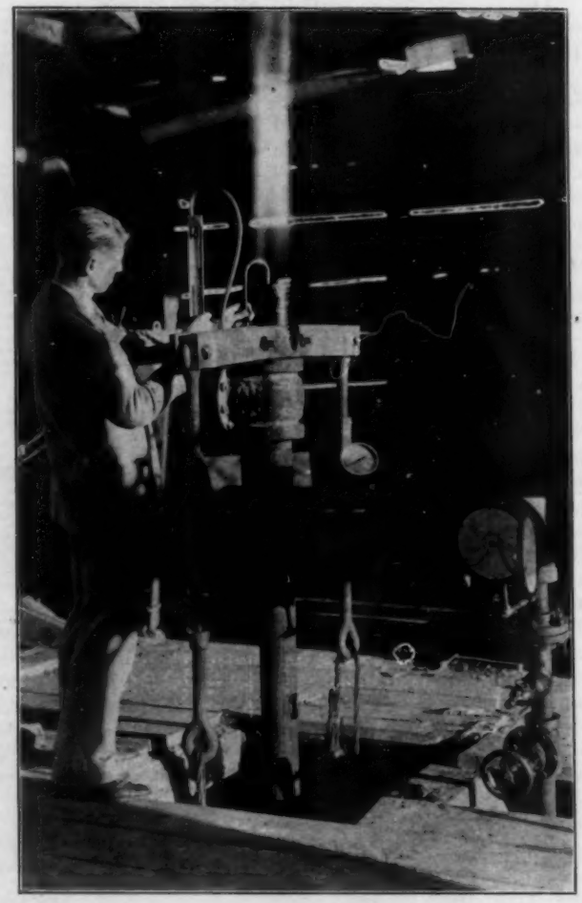
By Frank F. Finney

General Superintendent, Gas Department, Indian Territory Illuminating Oil Company

FOR unknown ages the rivers have been carrying salt down to the seas and lakes. According to geologists, these concentrated waters and salt beds have been buried in times of flood when the rivers carry much sediment, by layers of mud and sand, which have hardened into rocks. Later, the uplift of land and surface erosion exposed layers of rock salt, and deep drilling reveals the presence of salt veins and brine which fills the pores of the sedimentary rocks.

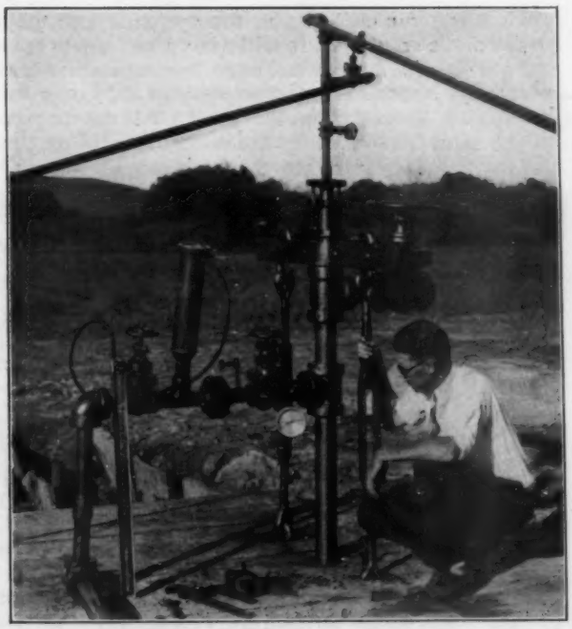
Salty waters are found in close association with petroleum and natural gas, there being scarcely an oil or gas field on record in which saline waters are not encountered. The explanation has been made that the conditions favorable for the accumulation of organic matter from which natural gas and petroleum originated, in stagnant water, are likewise favorable for the accumulation of salt deposits. Although the chemical composition of water differs in some degree in different fields and at various depths, the term salt water as widely used, includes all saline waters encountered in drilling operations, and their salinety is usually due to the presence of sodium chloride although sodium sulphate may sometimes impart this quality and some waters are primarily alkaline. To exclude salt water from the producing gas formation and to control it when present, is the most important problem of the natural gas producer.

Whether the gas well dies prematurely or lives a long life of useful service depends largely on the workmanlike manner in which it is completed, and the skill with which it is operated. In most fields salt water is a constant menace, striving for mastery which it wins in the end. According to Boyles Law, if a sand with an initial rock pressure of one thousand pounds is reduced to five hundred pounds, ignoring the small correction for atmospheric pressure, one-half of the gas remains. The encroachment of salt water may restrict the producing area so that the application of this law is only approximate. In order to take out the ultimate amount of gas it is necessary to prolong the "trapping" out of the gas from the well bore or the "drowning" of the gas to the lowest possible pressure.



Gauging open flow volume of a well

The water encountered in drilling is described in order of its occurrence to the producing formation as top, edge, water in the base of the sand, and bottom water. The emphasis, in this article, is desired to be placed on the methods of combatting the salt water inherent in the sand itself, as here it is believed there



Gauging by back pressure method

is opportunity for the most improvement. That which follows in reference to shutting off top and bottom water is the common knowledge and practice of oil and gas producers.

To eliminate caving from above and the chance of migration of gas as well as to shut off all upper water, it is the custom to set the casing as close to the top of the producing sand as conditions will permit. If all the water is cased off by the preceding, the casing shutting off the water should not be pulled on the completion of the well, as it provides additional insurance of keeping the water permanently shut out of the gas sand. Moreover, it permits the inner casing to be pulled without flooding the sand should it be found necessary to replace it at any future time on account of leakage caused by corrosive water. The hole can be reduced and the casing safely set in the top of the producing sand of lime if it is solid and impervious and the gas is not encountered in the upper part. When no suitable formation solid enough to hold the casing exists, or if the gas is found at an unexpected depth and the hole has not been reduced to provide a casing seat, cementing must be resorted to, or packers may be used if a shell exists in which to set them. Whether there is water or not to shut off, a tight bond must be secured between the casing and wall to confine the gas. A screw or disc packer may be used, or an anchor packer with perforated pipe below, to permit the entrance of gas into the casing.

Cementing Is Preferred

Due to the absence of a proper formation in which to set the packers, and inaccurate well and casing measurements, a shut off is not always obtained the first time the packer is run and sometimes not at all. On account of this uncertainty and the fact that the rubber is subject to deterioration as it ages, cementing is preferred by many operators and is universally used in the fields where soft and loose formations prevail and the wells are rotary drilled. Although casing is sometimes cemented by the use of tubing or dump bailer, the two plug method is in most general use.

In many localities where suitable casing shoulders can ordinarily be found and a formation shut-off obtained by use of shoes on bottom of the casing, mudding can be substituted for cementing. Mudding not only prevents the leakage of water and gas around the casing shoe but also protects the pipe, as also does cement, from action of corrosive waters to a considerable extent and protects the upper sands from water intrusion. The choice of the mudding

Blowing to remove salt water

method depends largely on the circumstances, but it is of primary importance that the mud be free from sand, lime or grit, and that suitable clay and shale be saved in a separate pit when the well is drilling.

A common practice is to fill the casing by pump or steam jet after landing it and to lift the pipe and permit the mud fluid to rise on the outside. The pipe should be set back immediately to avoid "freezing." The mud is at times pumped to the bottom through a string of tubing, or as in rotary drilling, circulated back of the casing. If it becomes necessary to kill a large flow of gas, the well can be "lubricated." The mud settles into the well, by this method, by gravity from one or more joints of casing connected vertically to the top joint of casing and is alternately filled and emptied into the well by the opening and closing of gate valves with which it is equipped.

Procedure After Cementing

After the well is cased and mudded or the cement has set and been drilled out, and the hole has been bailed dry, the well is allowed to stand for at least twelve hours, when the bailer is again run. An additional test should be made of the tightness of the casing where possible by shutting the gas in when first encountered before drilling the well in to its full capacity. It is when the fluid is bailed out that the casing is put to a severe test and casing of sufficient weight should be used to insure against collapsing. The Bureau of Mines recommend that the strength of the casing used be twice the pressure exerted by a column of fluid the same length of the casing.

When the top water has been successfully excluded, the problems presented by water in base of sand, edge water, and bottom water remain. Bottom water is described as water below the producing sand, separated from it by a distinct break. The correlation of existing well logs is necessary, and graphic cross section plats are of assistance in the study of sub-surface water problems. The determination of the exact water level is not always possible. Inaccuracies of well logs account for some errors, and sands are often lenticular and of varying porosity, permitting water to exit in separate parts of the sand. In the determination of proper depth to drill into the sand, the cuttings, as they are washed out or blown from the well, reveal much to the man who has gained experience from drilling wells in the same territory.

Not only are samples to be carefully noted, but after the gas is encountered, the flow should be frequently gauged with a pitot tube and as long as the gas is increasing, the danger of water is slight, although it is possible for water to be separated by so thin a break as to be imperceptible. When this condition exists, it is impossible to plug it off, but if separated by an impervious strata of sufficient thickness, it may be plugged off by cementing with dump bailer, the use of lead wool, or of patented plugs of different characters.

Use of Clay

Solid clay dropped into the hole in small pieces, bridged, and cemented on top, is effective in shutting off water if the water is far enough below the formation to be plugged back to. Water having been avoided in the bottom of the sand or bottom water successfully plugged off and gas in commercial quantities having been developed, the well must be properly equipped to retard the encroachment and to provide for the removal of water if it makes its appearance.

That water which lies in the syncline and moves up the slope as the gas is withdrawn and the pressure is reduced, is known as edge water and is most effectively controlled by the maintenance of a constant back pressure on the sand. As the pressure on the sand is reduced by the withdrawal of gas, and the ingress of water into the hole can no longer be avoided, it is to be removed with as little loss of gas and reduction of pressure as possible. Great quantities of gas are being wasted to remove water from wells which could be removed with a fraction of the loss in energy and gas which is uselessly dissipated. The water can be removed from the average gas well, which is delivering into a pipe line with pratically no loss of gas if it is properly equipped and operated. If the practice of taking the open "flow gauge" is discontinued the pressure at the head of the well need never be reduced to atmosphere except for repairs.

Size of Tubing

To be prepared to handle the water, tubing is run with a packer. The size of the tubing to be used is governed by the volume of the well. It is customary to tube wells under three million cubic feet with two-inch tubing, and wells above that amount and not exceeding seven million cubic feet with three inch. Two cages or openings to admit the gas are used, one directly below the packer and the other several feet up from bottom. If there is sufficient room between the gas and the bottom of the casing and the formation is suitable, the packer is to be set in that interval; if this is not the condition, it is set in the bottom of the casing.

If the volume is too large to permit the tubing with packer to be lowered into the hole, the packer can be dispensed with and the tubing run to act as a siphon line. A three-quarter-inch siphon line consisting of wrought iron pipe with extra heavy couplings is used in two-inch tubing and one-inch pipe in three-inch tubing. A nipple with several quarter-inch holes is placed in the siphon line near the bottom of the hole and one or more jet nipples, each having one small hole about three-sixty-fourths of an inch for three-quarter-inch pipe and one-sixteenth inch for one inch, may be used at several hundred foot intervals up the hole.

The pressure exerted by a one-hundred-foot column of average salt water is about forty-six pounds, and this column may rise to a sufficient height to overbalance the rock pressure and to drown out the gas. When this happens, the water is removed and the well is started operating again by raising the siphon and lowering it to bottom by stages, extraneous high pressure gas or compressed air being turned into the tubing to blow out the water. The proper spacing and submergence of jet

nipples should be the subject of some engineering study for each particular well and although satisfactory results can be obtained by actual trial, this may necessitate pulling and running the siphon line several times. A decreased head of water is lightened and broken into a spray by the gas bubbling through the jet. A steady flow of high pressure gas, if available, can be passed into the tubing to jet the water out of the siphon line without loss of gas from a well incapable of producing its water on account of low rock pressure. A stuffing box confines the gas in the tubing, the tubing being anchored by anchor clamps and turn buckles to the casing.

The blowing of the water by siphon lines intermittently or even continuously into the atmosphere, is a decided improvement over opening up the tubing or casing as is done in many instances, but there is some waste by this method which is avoidable in ordinary circumstances if the pressure is regulated at the well by the use of small hole orifice discs or choke nipples installed in the delivery line from the tubing. The blow-off line connecting the siphon line is connected directly into the separator which is connected to the pipe line on the low pressure side of the regulating device. To the separator is connected an automatic trap which discharges the collected water without loss of gas. The siphon line carrying the rock pressure of the well meets only the resistance of the line pressure which is greatly reduced in average operation and discharges the water into the separator. As much as seventy-five barrels of water per day is being automatically ejected from wells operated by an Oklahoma gas company with a volume of less than one hundred thousand cubic feet per day and rock pressure of about four hundred pounds, the ratio being about one barrel of water per thousand cubic feet of gas.

Value of Orifice Disc

The use of a small hole orifice disc is of great value in the maintenance of a constant pressure on the sand. Providing the pressure on the pipe line is 56 per cent or less than the pressure back of the disc at the well head, further reduction of line pressure will have no effect on the well pressure. This important fact enables the proper size disc to be installed to carry the minimum pressure that is desired to be carried on the well without danger that the pressure will be lowered below that point by reason of fluctuations of line pressure.

A seven-day recording gauge records the pressure carried on the well and should the pressure drop, if the ratio mentioned exists, it indicates in most instances that the well is loading up with water, although it may be caused by leakage having developed in the tubing or packer, or from some other cause within the well itself. The back pressure advisable to hold will vary with different wells depending on depth, porosity of sand, water and possible other factors. Data obtained from operation records indicate that the average well operating at 90 per cent of its absolute rock pressure is delivering approximately 20 per cent of its open flow.

Certain state and government conservation rules and regulations require an open flow gauge to be taken monthly or quarterly to set up periodical standards to prevent the withdrawal of too great a percentage of gas. This is an indirect, harmful method of preventing the reduction of pressure on the well to an injurious extent. Although the waste of gas occasioned by this practice is enormous, it is of little consequence in comparison to the injury done to wells as a result of sudden withdrawal of gas and reduction of pressure on the sand. The amount of gas that a well will deliver at any pressure can be as readily determined by gauging the flow with a pitot tube or orifice prover with the back pressure held on the well, as the wide open flow capacity of the well. The pressure will not be reduced on the sand to a harmful extent and only about one-fifth of the gas wasted as compared to the open flow, if the test is on the 90 per cent basis.

Volume of Gas Ascertained Directly

The amount of gas that can be actually delivered into the pipe line is ascertained directly rather than the open flow capacity of the well which means little without the relationship of rock pressure and line pressure. The open flow capacity can be obtained indirectly, if required, as explained by E. O. Bennett and H. R. Pierce, engineer and consulting engineer, respectively, for the Bureau of Mines, in a paper entitled "New Methods for Control and Operation of Gas Wells," read before the Natural Gas Association on May 20, 1925. The absolute open flow or open flow at the sand is calculated and the capacity of the well at varying pressures is measured and plotted. It is assumed, as collected data indicate, that the decrease in the pressure gauged volume and open flow volume is approximately in the same proportion and a chart showing the working capacity in percentage of absolute open flow is made on the basis of the original test. The development of disc control of gas wells is due largely to the initial efforts of the engineers mentioned.

Salt water, after its removal from the well and until it is finally desiccated or diluted with rains and fresh surface water, retains its power to cause trouble. Despite much money spent in the construction and fencing of earthen reservoirs, seepage is unavoidable in some soils, resulting in real or imagined damages to farmers and stockmen. Some companies are disposing of salt water by pumping it back into shallow wells, drilled to salt water sands, with casing cemented to protect the fresh water above. The late Charles Page established a plant at Sand Springs, Oklahoma, which is successfully producing common salt and certain more valuable chemicals, among which are iodine, bromine and Epsom Salts. Several thousand barrels of brine are pumped daily from oil and gas wells to this plant and treated by a process involving electrolytic action. This experiment may be conducive to a wider adoption of this or some other process, and under favorable conditions, much salt water from wells may be converted from a liability into an asset.

Manufacture of Low Gravity Water Gas

By L. J. Willien and Louis Stein

PART I

Plant Operating Method Used

By Louis Stein

Northern States Power Co., Minneapolis, Minn.

APPROXIMATELY 67,000 customers are supplied with gas in St. Paul and their requirements average 7,750,000 cubic feet of 550 B.t.u. gas per day, with peak days exceeding 10,000,000 cubic feet. The major source of supply is coal gas supplied from coke ovens at the rate of 5,500,000 cubic feet per day for six months and 6,500,000 cubic feet per day for the other half year. The gas has a calorific value of 550 B.t.u. and its variation in specific gravity is from approximately 0.38 to 0.43. It is pumped at a uniform rate per hour through a 16-inch main to a 3,000,000 cubic foot storage holder five miles distant from the plant. About a year ago a connection was made to a 1,000,000 cubic foot holder midway between the point of production and the larger holder for the purpose of receiving coal gas when available in excess of contractual obligations. During the six months' period of maximum sendout the transmission line is utilized to its fullest capacity with the available pumping equipment.

Mixed-Gas Problem

The gas thus supplied is obviously insufficient to supply the entire requirements and it is, therefore, necessary to manufacture carburetted water gas to make up the deficiency. Due to the location of the respective coal-gas and water-gas plants and the storage holders, as well as to the peculiar layout of the transmission and distribution systems, it is necessary to distribute straight coal gas to approximately 50 per cent of the territory served. The balance of the territory is served with varying mixtures of gases, at times being straight coal gas and other times straight water gas. There is, however, no sharp line of demarcation between the straight coal-gas district and the mixed-gas territory as might be inferred from the foregoing.

The specific gravity of the gas formerly distributed in the mixed-gas district varied from 0.38 to 0.70, with all of the attendant service difficulties. It became necessary to consider what could be done to improve the gas service in the mixed-gas district without impairing the service in the coal-gas district. Several possibilities were considered, namely: The installation of additional storage holder capacity; the construction and operation of a mixing line between the water-gas plant and the 3,000,000 cubic foot holder; the installation of a water-gas plant at a different location; the availability of gases of the same composition and specific gravity as coal gas; the availability of coal gas of higher specific gravity; the possibility of manufacturing oil gas in carburetted water gas equipment for peak days only, and the possibility of manufacturing a lower gravity carburetted water gas.

Oil Used in Back-Run

After giving careful consideration to all of the possibilities, including probable investment charges and operating expenses, a decision was reached to attempt to manufacture carburetted water gas having a specific gravity low enough to burn satisfactorily in appliances adjusted for straight coal gas in the mixed-gas area. Therefore, without making any changes in the water-gas apparatus, experiments were commenced to determine what results could be obtained by the admission of oil during the back-run portion of the gas-making cycle. The equipment used consists of an 11-foot set equipped with back run, automatic control, recording pyrometer and steam flow meters, and using exhaust steam at five pounds pressure from a steam accumulator.

For the first tests a part of the oil was introduced through the spray in the top of the carburettor during the back run, the balance being admitted on the up run. The first experiments were made commencing October 28, 1926, at which time bituminous coal was used as a generator fuel. The resultant finished gas had a specific gravity approximately 16 per cent lower than that made in the ordinary manner. The tests were continued October 29, November 9 and November 11 with coal as generator fuel.

Commencing November 12 coke was used in place of coal as generator fuel because the temperature in the carburettor became too low simultaneously with excessively high temperature in the superheater. Furthermore, it was believed that a higher fuel-bed temperature could be maintained in the generator with coke, which would result in a better overcracking of the oil. As a result it became possible to increase the amount of oil admitted on the back run due to availability of a higher temperature fuel bed. The most interesting feature of the change was the resultant further reduction of specific gravity, the finished gas being about 20 per cent less dense than ordinary carburetted water gas.

Due to a continued unbalance of carburettor and superheater temperatures, and to difficulties encountered with lampblack, it was decided to admit oil during the back run near the top of the super-

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Presented at A. G. A. Convention, Oct. 10-14, 1927, Chicago.

heater instead of in the carburettor. Consequently several nozzles for this purpose were installed in the superheater. The results of experiments after this installation clearly indicated that this change was sensible. The only other changes which were made following experiments with oil nozzles in the superheater included enlargement of the overflow connections from the wash box to permit the introduction of a larger volume of water for lampblack removal and the conversion of a condenser to a lampblack scrubber.

Advantages Achieved

Approximately one year has elapsed since the foregoing experiments were begun and it may be said that with back-run equipped machines either straight coke or a mixture containing not to exceed 65 per cent bituminous coal may be used successfully for the production of low gravity water gas with oil admitted during the back run at the superheater.

The finished low gravity water gas has been distributed for some time, unmixed with any other gas, to consumers in the mixed-gas territory with a very notable decrease in service difficulties as compared with previous conditions in the same district. In connection with the distribution of low gravity water gas a series of tests were made to determine the maximum variation in gravity which the ordinary domestic appliance now used would burn satisfactorily.

On days when the supply of coal gas is insufficient for proper mixing, it is now standard practice to manufacture and distribute low gravity water gas, a practice which has been found successful because it has improved the service to the customer. Furthermore, it has made unnecessary the investment of comparatively large amounts of money in other directions to effect the same result.

PART II

Interpretation and Results

By L. J. Willien

Byllesby Engineering and Management Corp., Chicago, Ill.

OF the various gases that make up the composition of any type of manufactured gas there are only two which have a specific gravity of less than 0.97, hydrogen and methane. The specific gravity of hydrogen is so low it is apparent that the best way to reduce the specific gravity of carburetted water gas is to increase the percentage of hydrogen. The specific gravity of carburetted blue gas cannot be reduced by increasing the hydrogen from the blue gas reaction because of the CO or CO_2 formed at the same time. A perfect blue gas containing 50 per cent CO and 50 per cent H_2 will have a specific gravity of 0.52. The best way, therefore, to reduce the specific gravity of carburetted blue gas is to increase the percentage of hydrogen without a proportional increase in CO or CO_2, or to keep the percentage of hydrogen the same and reduce the percentage of CO or CO_2, or both.

Composition of Back-Run Gas

The blue gas made during the back run usually contains more hydrogen than that made during the up run, as shown by the following analyses.

	Up run	Back run
CO_2	5.3	4.7
Ills.	0	0
O_2	.2	.3
CO	38.8	38.1
CH_4	1.8	2.1
H_2	48.0	53.6
N_2	5.9	1.2
Sp. gr. calc.	0.53	0.50

It is believed that the increase in the hydrogen content of the back-run gas is due to the oil that is in the carburettor and superheater when changing from the up run to the back run being carried back with the back-run steam through the fuel bed. A sample of gas was taken from the top of the generator during the back run and analyzed. While it is true that the gas at this point was mostly steam, nevertheless there was an appreciable amount of non-condensible gas which had the following composition:

CO_2	9.0
Ills.	2.8
O_2	.8
CO	3.8
CH_4	9.1
H_2	67.0
N_2	8.1
B. t. u. calc.	378

Adding Oil During Back Run

A few years ago while making an investigation in a small water-gas plant, where one of the water-gas machines was equipped with a back run, oil was introduced during the back run just as an experiment to see what would happen. From the best recollection either anthracite coal or coke was used at the time as generator fuel, and the oil introduced during the back run was equivalent to about 2½ gallons per M. The oil was introduced into the top of the carburettor through the regular oil spray and a sample of the back-run gas was taken and analyzed. The results of this analysis were as follows:

CO_2	1.2
Ills.	1.8
O_2	.0
CO	21.0
CH_4	18.1
H_2	57.5
N_2	0.4
B. t. u. calc.	476
Sp. gr. calc.	0.39

The gas analysis clearly showed that the gas oil was overcracked forming considerable H_2. This is not desirable in normal water gas operation so the matter was not given further consideration until the

situation in St. Paul presented itself, demanding lower gravity water gas.

From the analysis it was calculated that the back-run gas made, when introducing oil during the back run, contained 46 per cent blue gas and 54 per cent oil gas. Calculations also indicated that the oil gas had the following composition:

Unsaturated hydrocarbons	3.3%
Saturated hydrocarbons	34.0%
Hydrogen	62.7%

The percentage of oil gas, its composition and the gravity of the back-run gas all indicated that the oil in passing through the fuel bed was pretty thoroughly decomposed. It was therefore believed that if a back-run gas of such a character could be made it would materially reduce the gravity of the finished gas.

Experiments at St. Paul

Since the water-gas machines at St. Paul were equipped with back runs it was a simple matter to experiment and see what would happen when introducing oil during the back run. The first experiment was made by introducing 12 gallons of oil during the back run over one coaling period. The oil was introduced through the oil spray at the top of the carburettor. A composite sample of the back-run gas was collected in a large carboy. A comparison of the analysis of the back-run gas made when introducing oil with the back-run gas made in ordinary operation showed the following: The CO_2 decreased 0.8 per cent; the illuminants were increased 1.9 per cent; there was a decrease of 9.3 per cent in the CO; the methane increased 3.7 per cent, and the hydrogen increased 6.0 per cent.

Further experiments were made introducing 25 and 30 gallons of oil during the back run. The results were practically the same as the first experiment, the increased amounts of oil making the observed effect more marked. The gravity of the back-run gas produced was about 0.42 against 0.48 under regular operation. On the last test, which was of two hours duration, using 30 gallons of oil on the back run, a sample of the finished gas was taken for analysis. This gas had a gravity of 0.53. The engineed of distribution also tested this gas with a gas stove on which the burners were adjusted for straight coke oven gas. This test indicated that the gas was satisfactory as a substitute for coke oven gas.

Use of Coke in Generator

All of these tests were made with a 100 per cent bituminous coal as generator fuel and indicated that the operating conditions were not favorable for the production of this kind of gas over a long period. It was therefore decided to repeat them using 100 per cent coke as generator fuel. The first test was a two hours' run using the regular coke cycle. The operating conditions were much improved and a finished gas of 0.53 gravity was produced. It was then decided to make a three-day test and send the gas out to the mixed gas district without the addition of coke oven gas. The test was successful, the complaints from the district served were no more than when served under ordinary conditions with a mixed gas.

Analyses of the back-run gas made during these tests are given in Table I and those of the finished gas in Table II. These analyses show that there was a reduction in the gravity of both the back-run gas and the finished gas when introdueing oil during the back run as compared with normal operation. There is very little difference in the gravity of the finished gas made with bituminous coal and that made with coke. This is in spite of the fact that a blow run was used with bituminous coal and none used with coke. However, if the finished gas made with bituminous coal is reduced to N_2 free basis the gravity will be .51 instead of 0.53.

Table I also shows the percentages of blue gas and oil gas in the back-run gas made with coke. It also shows the composition of the oil gas. It will be

TABLE 1.

Analyses of Backrun Gas Made When Introducing Oil at Top of Carburettor During the Backrun

	10-28	10-29	11-9	11-11	11-12	11-15	11-16	11-17
CO_2	3.8	4.8	1.8	1.8	3.2	1.6	1.8	1.5
Ills.	2.1	3.2	4.8	3.2	2.4	2.4	2.0	2.4
O_2	0.3	0.2	0.4	0.4	0.6	0.2	0.2	0.6
CO	24.4	21.7	27.0	19.6	23.5	21.6	22.4	20.4
CH_4	8.2	7.4	12.1	9.2	8.5	8.6	8.1	7.9
H_2	62.0	62.2	64.5	66.0	62.6	66.4	65.8	66.5
N_2	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.7
B.t.u. (Calc.)	411	420	496	443	420	436	412	416
Sp. Grv. Calc.	.413	.416	.467	.370	.406	.360	.362	.374
Oil Back-run Gals.	12	25	30	30	30	35	35	35
Fuel Used	Coal	Coal	Coal	Coal	Coke	Coke	Coke	Coke
% Blue Gas	....	....	....	....	67	48	50	46
% Oil Gas	....	....	....	....	33	52	50	54
B.t.u. per cu.ft. Blue Gas	....	....	....	....	270	323	319	322
B.t.u. per cu.ft. Oil Gas	....	....	....	....	730	540	506	500
Composition of Oil Gas								
Ills.	....	....	....	....	5.6	4.5	4.0	4.5
CH_4	....	....	....	....	19.8	16.2	16.1	14.9
H_2	....	....	....	....	74.6	79.3	79.9	80.6

TABLE II.

Analyses of Finished Gas Made When Introducing Oil at Top of Carburettor During the Back-run.

	Nov. 11	Nov. 12	Nov. 15	Nov. 16	Nov. 17
CO_2	2.4	2.4	2.3	2.0	2.2
Ills.	9.0	8.2	8.1	7.6	8.2
O_2	0.5	0.4	0.6	0.5	0.5
CO	20.7	27.1	27.2	27.5	28.0
CH_4	13.7	12.5	11.7	12.4	10.5
H_2	47.0	48.0	49.5	49.0	50.6
N_2	6.7	1.4	0.6	1.0	0.0
B.t.u. Calorimeter	549.0	537.0	550.0	552.0	548.0
B.t.u. Calculated	564	524	551	547	548
Sp. Gr. Calculated	.53	.53	.52	.51	.51
Air %	....	2.0	3.0	2.5	2.5
P. C.	....	0.0	0.0	0.0	0.0
Blue Gas %	....	62.4	62.3	62.0	63.6
Oil Gas %	....	35.6	34.7	37.5	33.9
B.t.u. due to Blue Gas	....	202.0	202.0	202.0	206.0
B.t.u. due to Oil Gas	....	335.00	348.00	350.0	342.0
Oil per M	....	3.67	3.55	3.59	3.56
B.t.u. per gal	....	91300.0	98000.	97500.	96000.
Cu. ft. oil gas - gal	....	97.0	97.8	104.4	95.2
B.t.u. - cu. ft. O. G.	....	940.0	1000.	935.	1010.
Generator Fuel used	Coal	Coke	Coke	Coke	Coke
Oil on Back-run, gals	30	30	35	35	35
Test Duration	2 hr.	2 hr.	5 hr.	5 hr.	2 hr.

noted that these results are practically the same as those obtained from the earlier analysis. It is interesting to note the amount of oil gas made per gallon as shown in Table II. The average for the total oil used on both the up run and back run is about 100 cubic feet as compared with 65 to 70 cubic feet in ordinary operation. An attempt was made to calculate the amount of oil gas made during the back run, and as nearly as could be determined it was about 150 cubic feet per gallon. Another interesting thing is the oil efficiency in B.t.u. per gallon. The oil efficiencies in Table II were calculated by the Pacific Coast method and show an apparent reduction of not more than 5 or 10 per cent.

Operating Results

All through the winter 1926-7 this process was used on peak load days. It was only necessary to use it on 11 days. The following is a comparison of the operating results with normal operation using both 100 per cent bituminous coal and 100 per cent coke.

	Introducing oil on back run. Coke as fuel	100% coal Normal operation	100% coke Normal operation
Make per hr. (M. cu. ft.)	227	150	184
Fuel per M. (lbs.)	21.89	29.00	29.69
Oil per M. (gals.)	3.61	3.08	3.28
B.t.u. per cu. ft.	552	557	583

These results show that introducing oil during the back run increased the capacity 23 per cent over normal operation with coke and 51 per cent over normal operation with coal. The fuel per M was reduced about seven pounds and the oil increased about 0.5 gallons. The increase in capacity and reduction in generator fuel was due to the increase in the amount of oil gas made per gallon.

Use of Oil in Superheater

Introducing the oil in the top of the carburettor was not entirely satisfactory from an operating standpoint. The principal objection was a material lowering of the temperature in the top of the carburettor. Besides the oil was simply vaporized and stuck to the top of the fuel bed in a vapor form. With bituminous coal the top of the fuel bed was comparatively cold and the oil vapors condensed when coming in contact with it and all of the oil would not go down through the fire. The oil vapors leaked badly around the generator charging door. This was worse with bituminous coal than with coke. There was no apparent increase in capacity or reduction in the fuel per M with bituminous coal.

It was believed that if the oil reached the top of the fuel bed in the form of a permanent gas instead of a vapor the objectionable operating features would be overcome. Apparently the simplest way to accomplish this was to introduce the oil at the top of the superheater. Last spring one machine was equipped with four oil sprays equally spaced around the top of the superheater. Since these sprays were installed there has been no need of making a low gravity water gas. Nevertheless a series of tests were made to determine what improvements, if any, resulted from the change. Most of these tests were made with bituminous coal in order to determine ii the change would increase the capacity and reduce the generator fuel. The sendout conditions, however, were such as to render these tests very unsatisfactory. Some days the tests were hardly begun before it became necessary to shut down. The

TABLE III.

Test Made on Introducing Oil at Top of Superheater During the Back-run.

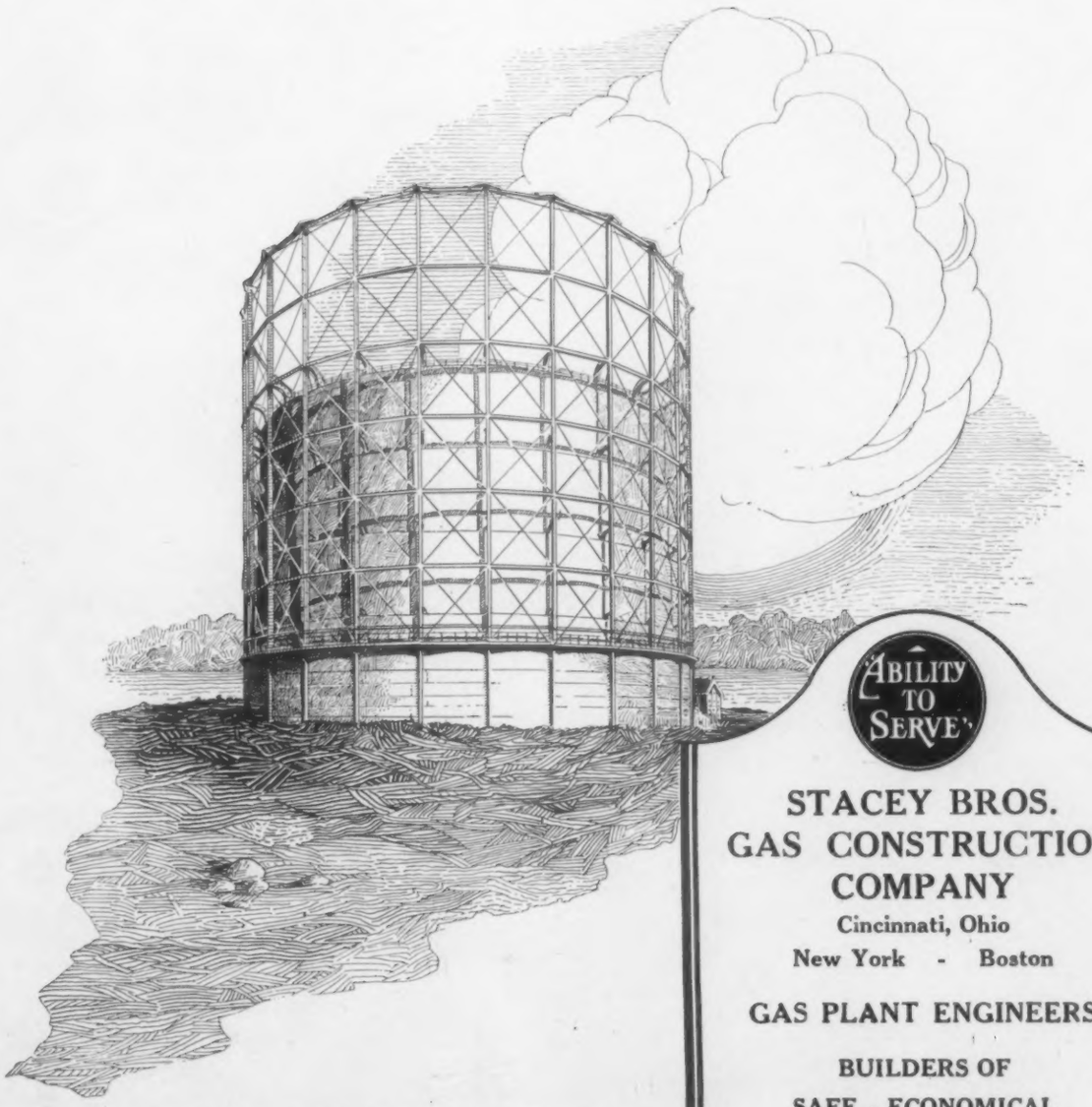
Test Number	1	2	3	4	5	6	7
Fuel Used	Coal	Coal	Coal	Coal	Coal	Coke	65% Coal 35% Coke
Gallons of oil used on back-run	None	15	15	20	20	20	20
Rate of oil input gal. per min.	....	32	15	15	15	15	15
Pressure at top of superheater.	....	56	36	35	36	26	28
Total gas made, M cu. ft.	828	1598	1042	523	570	897	2083
B.t.u. per cu. ft.	558	549	556	534	552	542	556
Operating Cycle	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.	5 min.
Blast	34%	34%	34%	34%	34%	26%	36%
Uprun	34"	34"	34"	27"	28"	35"	27"
Oil Admission	28"	28"	28"	24"	24"	29"	24"
Back-run	25"	25"	25"	32"	32"	32"	32"
Final Uprun	3"	3"	3"	3"	None	3"	3"
Blow-run	2"	2"	2"	2"	2" 2% steam purge		None
Purge	2"	2"	2"	2"	2"	2"	2"
Blow-run after charging	20 sec.	None	20 sec.	None	None	None	None
Uprun steam per min.	160	160	170	170	170	190	185
Back-run steam per min.	200	200	200	155	155	220	200
Gas Analyses							
Oil Gas (sample taken over.)	....	29 runs	20 runs	20 runs	18 runs	18 runs	16 runs
CO_2	....	1.7	1.0	1.5	2.9	1.4	1.7
Ills.	....	41.3	38.4	33.5	19.8	41.8	38.5
O_2	....	.2	.6	.8	.8	.6	.6
CO	....	7.9	8.4	7.2	11.7	6.0	7.2
CH_4	....	40.7	38.8	43.6	38.0	34.6	34.8
H_2	....	14.7	10.4	10.2	26.8	15.4	19.1
N_2	....	....	2.4	3.2	....	.2	....
B.t.u. calorimeter	....	1390	1311	1175	930	1288	1272
B.t.u calculated	....	1431	1332	1263	959	1381	1324
Back-run Gas, sam. taken over.	26 runs	20 runs	20 runs	20 runs	18 runs	17 runs	17 runs
CO_2	4.6	2.2	2.0	2.1	1.7	3.6	2.4
Ills.	.2	2.5	1.2	1.7	.8	.4	.6
O_2	.2	.4	.6	.3	.5	.7	1.0
CO	33.7	27.2	26.4	27.6	28.5	28.5	26.2
CH_4	4.5	7.6	9.7	9.0	6.3	7.5	8.4
H_2	56.0	63.3	59.4	60.0	60.0	58.4	58.0
N_2	.8	....	.7	....	2.2	.9	3.6
B.t.u. Calorimeter	349	417	416	419	383	374	372
B.t.u. Calculated	342	429	405	414	358	368	373
Sp. Gr. Calculated	.48	.42	.40	.42	.38	.43	.44
Finished Gas							
CO_2	2.8	2.7	2.2	3.1	3.0	3.0	2.7
Ills.	9.2	8.9	7.7	8.0	8.6	7.2	7.6
O_2	1.6	.9	1.0	1.1	.6	.8	.7
CO	28.6	26.2	25.3	25.4	24.7	30.8	28.0
CH_4	14.5	11.8	15.0	15.4	11.1	11.7	12.9
H_2	29.0	37.9	39.6	37.3	43.8	43.0	42.6
N_2	14.3	11.6	9.2	9.7	8.2	3.5	5.5
B.t.u. calorimeter	561	532	541	548	532	530	542
Sp. Gr. Calculated	.70	.62	.59	.62	.58	.58	.59
B.t.u. Calculated	549	531	539	558	530	523	533

tests were therefore not conclusive. Nevertheless some interesting results were obtained which we believe are worth giving in this paper.

Composite samples of the oil gas, as it reached the top of the generator, were taken over 16 to 29 runs from the connection between the generator and carburettor. Similar samples of the back-run gas were taken simultaneously from the back-run pipe. The samples were collected in large carboys and tested for heating value by burning it in a standard Junker calorimeter. Samples were also taken from the carboys for analysis. Samples of the finished gas were also collected in a carboy over the period of the test and tested in the same way. The results of these tests are given in Table III.

Pressure in Machine

Introducing oil at the top of the superheater eliminated the leaking around the generator charging door and the lowering of the temperature in the top of the carburettor. There was no way of determining the temperature at the top of the superheater, con-



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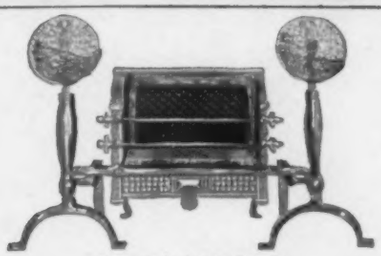
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sequently it was impossible to tell what effect the oil had on the temperature at that point. There was no effect on the temperature at the base of the superheater.

The specific gravity of both the back-run gas and the finished gas made in these tests was not so low as in the test made last Fall introducing the oil into the top of the carburettor. This is probably due to the smaller amounts of oil used on the back run, the maximum being 20 gallons per run as compared with 35 last Fall. It was hoped that putting the oil in the top of the superheater would permit the use of less oil. It was also felt that the oil sprays used were not the best for the purpose. Furthermore, when the oil was introduced at a high rate an excessively high pressure was developed in the top of the superheater. Once when it was introduced at the rate of 56 gallons per minute the pressure was 66 inches of water.

Effect on Set Capacity

There were no indications of any increase in capacity or a reduction in generator fuel when using 100 per cent bituminous coal. The best results were obtained in Test 5 in which the back run was made immediately after blowing. This was a short test, lasting only three hours, but in that time it was noticed that the cleaning door on the generator and the back-run pipe got pretty hot.

One thing was very noticeable and that was that a small amount of coke mixed in with bituminous coal seemed to make a difference in the capacity and generator fuel. On Test 7, with 65 per cent bituminous coal and 35 per cent coke, it was possible to operate about ten hours. The average make per run hour was 200 M and the fuel 26.47. This was without the use of a blowrun. The first two hours a blowrun was used and the make was 230,000 per hour. The blowrun was discontinued and the make dropped to 200,000 per hour and held there until shutting down. This was 8 per cent more than the make with normal operation using 100 per cent coke and 33 per cent more than with 100 per cent bituminous coal.

The oil-gas analyses are interesting. In every case they show the presence of some blue gas which confirms a statement made at the beginning of this paper. Test 4 shows the increased cracking of the oil due to increased time of contact as a result of the decreasing rate of steam input during the back run. In Test 5 considerable hydrogen was formed from the oil. This is to be expected due to the higher temperature in the carburettor and superheater immediately after blowing.

Lampblack and Naphthalene

Subjecting the oil to high temperature in the fuel bed naturally raises the question of lampblack and naphthalene formation. When using 100 per cent coke lampblack was made which gave some trouble in the wash box. This was eliminated by increasing the size of the funnel and seal pipe, also the overflow connection and the amount of liquor circulated through the wash box. Lampblack also appeared in the foul main to the relief holder, but so far it has not been serious. A scrubber is being placed just back of the machines which it is believed will entirely eliminate all lampblack trouble.

In the Pacific Coast oil-gas process about 20 pounds of lampblack is produced per M and is, I believe, the curse of the oil-gas process. In making a low gravity water gas about 1½ gallons of oil per M is introduced during the back run. This is about ¼ the amount used in the oil-gas process for the actual gas making. Assuming that the same amount of lampblack is made when introducing oil during the back run it would amount to five pounds per M.

Strange as it may seem, no naphthalene was made. At least tests made on the finished gas showed no signs of it. Apparently the temperature of the fuel bed is so high that it is broken up into carbon and hydrogen.

Apparently with bituminous coal there is no lampblack or else it drops out with the coal tar. Allowing the back-run gas from the back-run pipe to impinge on some white waste shows a decided dry lampblack deposit with coke and a heavy tarry deposit with coal.

Operating Costs

In normal operation at St. Paul 100 per cent bituminous coal is used whereas when making the low gravity gas 100 per cent coke was used. There is a differential of $3.48 between the price of coal and coke. The fuel and oil costs about two cents more per M for the low gravity gas than normal operation. If the increase in capacity is taken into account and its effect on the labor cost considered the low gravity gas costs about the same or if anything a trifle less. Even if it cost five or ten cents more per M to make the low gravity gas it has been found profitable to make it because it is a peak load proposition and the amount made in a year is a small proportion of the total sendout.

Summary

By introducing about 1½ gallons of oil per M during the back run it has been possible to reduce the gravity of a 550 B.t.u. water gas from 0.70 to between 0.50 and 0.55. This gas has been successfully used in a district ordinarily supplied with 100 per cent coke oven gas where the gas appliances are adjusted for coke oven gas.

Much better results are obtained when using 100 per cent coke or a mixture of coke and bituminous coal as generator fuel than when using 100 per cent bituminous coal.

With 100 per cent coke as generator fuel there is an increase of about 25 per cent in the capacity of the water-gas machine as compared with normal operation with coke and an increase of 51 per cent when compared with normal operation with 100 per cent bituminous coal. This is a great advantage because the low gravity gas is needed only during times of peak loads. If the capacity of the generating equipment can be increased materially at such times it means a saving in capital expenditure.

Even if gravity is not an important factor it is believed that with coke, by introducing oil during the back run and using a blow run the inerts can be

kept below 15 per cent and a further increase of 10 or 15 per cent in capacity obtained.

Indications are that, from an operation standpoint, the best place to introduce the oil is at the top of the superheater instead of at the top of the carburettor.

The experience at St. Paul so far has been limited to an 11-foot water-gas machine equipped with a back run and automatic control and to making a 550 B.t.u. gas. What results can be obtained on a machine equipped with a pier, automatic charger, revolving grates, or when making a lower B.t.u. gas, we are in no position to say because it has never been tried. It is believed, however, they would be an advantage. It is also believed that as the B.t.u. of the gas is lowered that the gravity will be lowered also. In lowering the B.t.u. it would probably be best not to change the amount of oil used on the back run but reduce the amount used on the up run. This would increase the proportion of back-run gas in the finished gas and should reduce the gravity.

The possibilities of this process seem unlimited and apparently the surface has only been scratched.

Practical Ideas from Practical Men

Novel kinks and improved short cuts in the plant, distribution, utilization and office

SETTING BOILERS NEAR FIRE

Not long ago I read a complaint by an engineer regarding modern boilers being set too high. He thinks we are overdoing a good thing and that boilers should be set lower.

My honest opinion is that there is little danger of placing boilers too high above the grates. It is logical that space is needed so that combustion will be complete before the boiler surface is touched by the hot gases. It is better to place the boiler too high than too low. If the boiler is too high, by several feet, it simply means that the boiler walls must be sufficiently well made so that the heat losses will be reduced to the minimum and so that there will be no inleakage of air. If the boiler walls can be construed so well that there are no heat losses whatever and so that there is no inleakage of air, there is practically no limit to the height to which the boiler may be placed without loss of efficiency.

There are so many factors that enter into furnace heat transfer that it is quite possible to get poorer evaporation even with better combustion. Good combustion cannot overcome the evils of soot and scale. Nor can good combustion overcome a great many other things which would require considerable space here and which are well known to most engineers.—W. F. Schaphorst, Newark, N. J.

CULVERT PIPE CASING ADDS TO SAFETY OF GAS MAIN

Installing gas lines under railroad tracks is at best a difficult job. The necessity for maintaining normal traffic while the work is under way subjects the work to frequent interruptions with consequent hazard to workmen and costly delays.

A plan recently adopted by the Houston Pipe Line Company when installing a 12-inch high pressure gas main in Houston, Texas,, was to encase it under railroad tracks in 15-inch Armco corrugated culvert pipe. The culvert pipe or casing absorbs the impact of the moving train loads, thereby lessening the likelihood of leaks or breaks. And,

Note spot welded nose at right

whereas a leak in an unencased line probably would not show up for some time and then be difficult to locate, in the encased pipe it would be more easily detected and traced to its source. Moreover by having the gas line in a casing, in case of a leak it can be removed with comparative ease out of harms way and repaired.

In the present installation two tracks of the Hous-

ton Belt and Terminal Railway were encountered about forty feet apart. On one of these traffic was particularly heavy, and for this reason it was deemed advisable to employ a method for installing the pipes in which no work would be done on the track level.

The first step consisted of boring the hole, by means of a long boring device, operated from one side. Next the culvert pipe was pulled into place. Then with everything in readiness, and the remainder of the main in place in the trenches adjacent to the track, the under-track portion of the pipe was threaded through the culvert.

To facilitate this threading a "nose" was spot-welded on to it. It took only a few minutes with a torch to remove the "nose" after the pipe was through. Butting and welding the sections of main together completed the job.—C. W. Webb, Houston, Texas.

TO STOP GASKETS FROM STICKING

The oil and gas industries require the use of gaskets in many places. A large percentage of the uses is with the discs and flanges of gas measurement assemblies, or in gas well pressure control equipment where discs are used. In these instances the gaskets are made of asbestos compositions and are most satisfactory when already cut to fit the flange.

Trouble is frequently encountered when attempting to remove gaskets after they have been in service for several months. The usual practice is to put oil or cup grease on the gasket before placing in the flange. This is satisfactory and prevents the trouble caused by sticking for a while, but in gas lines this practice is not effective after a short while in service.

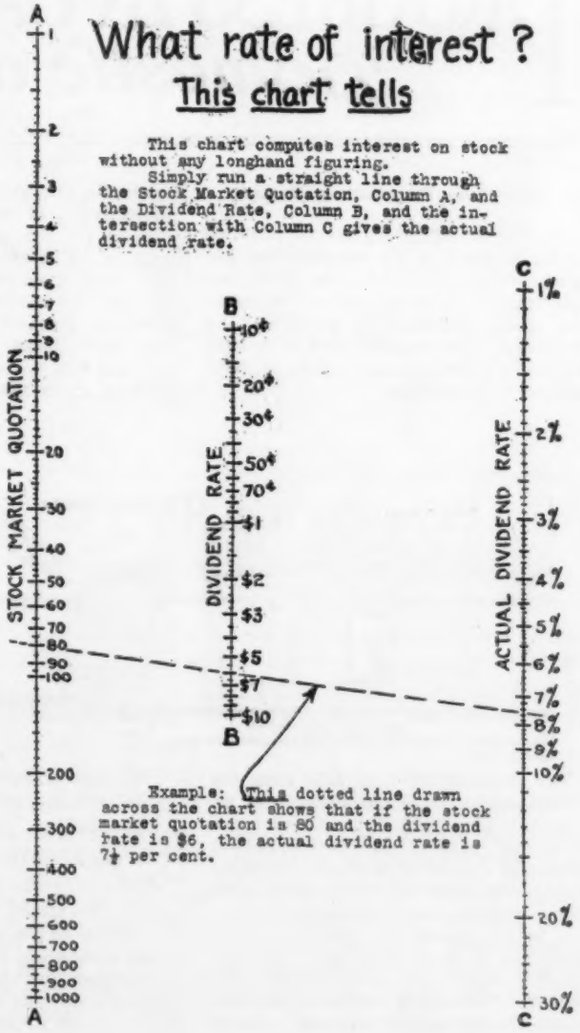
One plan that has been tried and given perfect success to prevent sticking of gaskets is to cover both the gasket, flange and disc face with a rust preventing grease every time the gaskets are installed. This plan absolutely prevents the gaskets from sticking even after long service and in the worst conditions.—H. F. Beardmore, Bartlesville, Okla.

INTEREST CHART FOR GAS ENGINEERS

Inasmuch as most gas engineers are interested in financial matters in connection with their business they will no doubt find this chart useful for quick interest computations.

Simply run a straight line across, as explained on the chart, and the actual dividend rate is immediately given in Column C.

The range of the chart is great enough to cover nearly every condition—from quotations of 1 to 1,000 and interest rates from 1 per cent to 30 per cent.—W. F. Schaphorst, Newark, N. J.

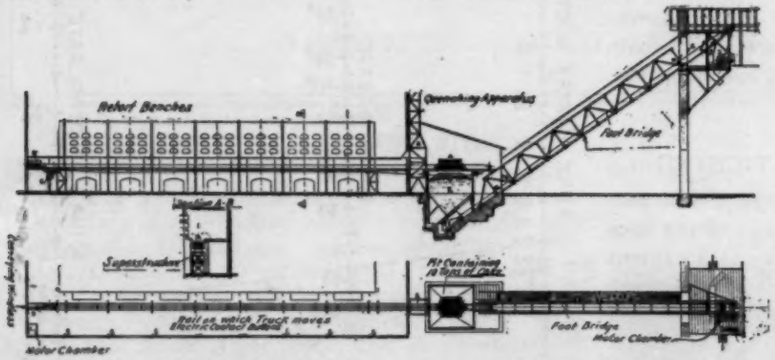

What rate of interest ?
This chart tells
This chart computes interest on stock without any longhand figuring.
Simply run a straight line through the Stock Market Quotation, Column A, and the Dividend Rate, Column B, and the intersection with Column C gives the actual dividend rate.
STOCK MARKET QUOTATION
DIVIDEND RATE
ACTUAL DIVIDEND RATE
A
B
C
Example: This dotted line drawn across the chart shows that if the stock market quotation is 80 and the dividend rate is $6, the actual dividend rate is 7½ per cent.

A striking and unusual newspaper "ad"

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

New Coke Transporting Device

Numerous difficulties are encountered in the removal of the incandescent coke from horizontal retorts, its quenching and transportation to various points in the plant, including its screening and crushing. The installation that is used for this purpose in a gas works in Switzerland is interesting.



The incandescent coke falls from the retorts into a truck A which runs on a track. The truck is caused to move by simply pushing an electric control button. It stops at B, where it is sprayed with water which serves to quench the coke. Pressure on another electric contact button causes the truck to move along and it then stops over the container S, where it is automatically discharged. When this operation is completed the truck returns back to the forward end of the bench of retorts, this also being automatically accomplished by means of a regulatable time relay. The truck does not stop until it arrives opposite the next retort in the series to be discharged. It takes about forty-five minutes for the contents of fifteen retorts to be discharged in this fashion. The truck A moves at the rate of about one and one-half feet per second. It is moved by means of an electric windlass with cable blocks. The motor is a two- and one-half horse power. The truck contains about 1,000 pounds of coke.

The coke is moved out of the container or reservoir S by means of a bucket conveying device, which is operated by means of the electric windlass at J, which is run by a seven and one-half horsepower motor. It will be noticed that the two principal parts of the conveying system are operated independently of one another. Thus an entire night's production of coke may be stored in the pit S without it being necessary to operate the screens during the night, the coke being removed from the pit the next day.—Monats Bulletin, 1927, number 9, pages 278-280.

Carbonization of Particles of Coal

There are many factors which determine the combustibility of coke. Some of these are the type of fuel carbonized, the temperature and rate of carbonization and the method of carbonization. The activity of the coke must depend on the physical and chemical character of its surface. In examining coke it is necessary to deal with the structure in detail and to distinguish between the diverse factors which may have a bearing on its properties. It is thought that the structure of the coke produced by the carbonization of small particles of caking coal and the variations which may be detected in cenospheres offer a means of differentiating the effects of variations in the methods of pretreatment of coal and of the conditions of carbonization since cenospheres lend themselves more readily than coke in bulk to measurement and detailed examination under the microscope.

Experiments were made on the influence of the atmosphere of carbonization and of mixing caking coal with non-caking material on the structure of the cenospheres. The furnace in which the experiments were carried out is shown in figure 1. The apparatus in figure 1a is for the purpose of introducing particles of coal into the furnace.

It was found that reduction in pressure, and to a smaller extent, an atmosphere of steam inhibit the formation of typical "cenosphere" window and lattice structure, appearing to allow the escape of gas produced during the carbonization. This does not take place in the cases of senospheres produced in nitrogen, coal gas, or hydrogen, the gas produced distending the particles to form cenospheres.

In mixtures made from increasing quantities of electrode carbon the cenospheres produced from coal and electrode carbon become reduced in size and the structure is also modified. For further details see Journal of the Society of Chemical Industry, 1927, pages 331T to 335T.

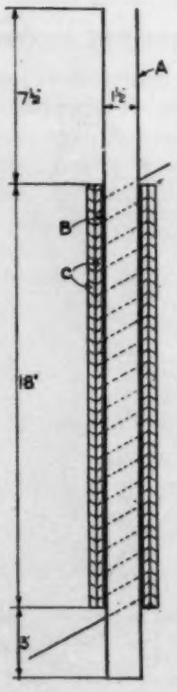


Fig. 1
A—Silica Furnace.
B—Outer Silica Tube
C—Asbestos Boards

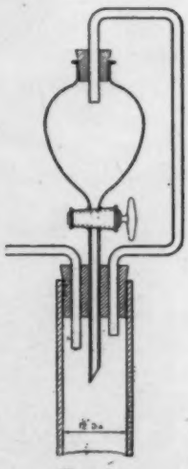


FIG. 1A.

Specific Gravity and Gas Quality

While the number of B.t.u. per cubic foot of gas is a satisfactory method of measuring the quality of a gas, nevertheless complete service to the customer is not necessarily guaranteed by his receiving a certain number of heat units in a cubic foot of gas at a certain fixed price. If apparatus is to function properly a fixed and constant number of heat units must be supplied in a given unit of time. The temperature of a furnace

would thus fall even though the same quality of gas was being supplied, simply because the quantity of gas furnished in a given time unit would vary due to the change in specific gravity. Thus this means that constant heat production necessitates constant volume delivery per unit of time and constant quality of gas.

An equation is derived from the quantity of gas in terms of the specific gravity and a factor k dependent on the burner aperture. Thus $Q = K \frac{1}{\sqrt{s}}$ in which Q is the gas volume for any given apparatus, and s is the specific gravity of the gas. Inasmuch as the volume of gas is inversely proportional to the square root of the specific gravity, equal volumes will be delivered from a given nozzle only when

$$\frac{k \times \text{calories per cubic meter}}{\text{square root of } s}$$

is a constant. It therefore follows that the condition can only be fulfilled if the increase or decrease in the specific gravity is accompanied by a corresponding increase or decrease in the thermal value of the gas.

A gas containing 4,220 calories per cubic meter (one calorie per cubic meter equals 0.1124 B.t.u. per cubic foot) and of specific gravity 0.475 is taken as standard and this would have a "normal figure" $\frac{4200}{\sqrt{0.475}}$ or 6100. Then the same normal figure or constant would be given by a gas whose specific gravity was reduced to 0.452 but whose thermal power was correspondingly reduced to 4,100, and by a gas whose specific gravity was increased to 0.497 but whose thermal power was correspondingly increased to 4,300.

Thus a variation of one hundred calories in the thermal power of the gas or 2.4 per cent, is equivalent to a greater variation in specific gravity of 4.6 to 4.9 per cent. An important point in this connection is the light that this throws on the practice of adding inerts to lower the specific gravity of the gas. These inerts will increase the specific gravity of the gas and hence to obtain normal operation of the gas burner, it will be necessary likewise to increase its thermal power.

The following tabulation is of value in showing which gases have more effect upon specific gravity and which more effect on calorific value.

(This article was originally published in Industria del Gas a degli Acquedotti and abstracted in Das Gas und Wasserfach, May 7, 1927. The abstract also appeared in Gas Journal, London, July 6, 1927.)

Gas	Specific Gravity s	Calorific Value Gross P	Net	Theoretical Combustion Temperature	Normal Gas Constant $\frac{P}{\sqrt{s}}$
Nitrogen	0.9674	....	....	....	....
Carbon dioxide	1.5288	....	....	....	....
Hydrogen	0.06949	3052	2570	1885	11604
Carbon monoxide	0.967	3034	3034	2030	3077
Methane	0.553	9527	8562	1795	12787
Acetylene	0.898	13832	13350	2110	14606
Ethane	0.967	14903	13939	1920	15098
Benzene	2.694	34423	33978	1860	21002
Distilled gases (dry)	0.44	5129	4576	....	7724
Distilled gases (moist)	0.45	7639	4142	....	6903
With 40% water gas	0.47	4192	3769	....	6100
Double gas	0.50	3270	....	....	4625
Water gas	0.53	2800	2573	....	3846
Producer gas from coal	0.94	1086	1039	....	1160
Producer gas from coke	1.00	939	931	....	939

Book Review

The Technique of Executive Control

By Erwin Haskell Schell. 143 pages. Published by McGraw-Hill Book Company, New York. Price, $1.75.

The new printing of the second edition of this interesting little volume again emphasizes that even the executive problem of industry is susceptible of careful engineering analysis. The author has eminently succeeded in utilizing the engineering habit of thought and in carrying out the purpose which is repeated in this revision from the preface of the first edition:

"To those who are searching for a constructive analysis of executive conduct, I offer this book. It is intended as a manual or guide to executive straight-thinking. It does not aim to draw arbitrary conclusions or to determine inflexible standards. Rather, it suggests and stimulates new avenues of reflection, and aids in the building of an executive method, best suited to the unique capacities of each personality."

The book can be most cordially recommended to any present or would-be executive. Whether the reader be one of long experience in executive position or one still looking forward to his first executive responsibility, he will find stimulating comment and interesting type problems presented to him in an attractive and readable fashion. The only reader who is likely to be disappointed or to find the book unprofitable is one who approaches it in an effort to find a ready-made answer for every executive problem. But that sort of individual is not one who is likely ever to be or to become a successful executive and his disappointment is therefore of little consequence.

Technical Methods of Analysis

By Roger Castle Griffin. 936 pages. Published by McGraw-Hill Book Company. New York. Price, $7.50.

There is no industry in which there is a greater variety of problems presented from day to day to trouble the analytical laboratory than in the gas indutry. Hence the gas laboratory will welcome most cordially an authoritative and comprehensive guide for testing of a multitude of industrial materials such as this second edition of a well known work. The value of the volume and the authoritative and skilled judgment exercised in the selection of methods is evident from the sub-title of the work, which refers to the methods as those "employed in the laboratories of Arthur D. Little, Inc., Cambridge, Mass."

The various chapters include a discussion of reagents, general inorganic methods, general organic methods, analysis of metals, of fuels, of paints and pigments, of oils, fats, waxes, and soaps, of water and sewage, and of a multitude of other materials that occasionally may require consideration in the gas laboratory. The book is a reference volume which should find a distinguished position and frequent use in every gas-works laboratory.

GAS MERCHANDISING

Domestic **Home Service**

Utility Hall—Its Merits and Aims

By Karen Fladoes

Home Service Director Philadelphia Company, Pittsburgh, Pa.

LIKE the snowball that gathers a load and grows larger in rolling, Utility Hall is the result of the growth of an idea. In all probability, no one really visualized nor anticipated what the final outcome would be. But now that Utility Hall is finished, everyone who has seen it feels that a new stride has been set for home service in a utility.

Now that we have such a background for Home Service Work, the question might well be asked, "What are we going to do with it?" A great deal has been written about the value of home service work to utility companies and that such departments have proven of value is evidenced on every hand by the large number of companies who have established service for home makers of one sort or another. Why is a utility so concerned with the home in the communities which it serves?

The business of home making is the greatest single industry in America today, and millions of women are engaged in the business of preserving the family unit without which no nation can hope to live nor grow great. A utility offers indispensable commodities and service to the home and therefore it is sound business for the utility to do everything possible to understand the homemakers' problems in order to be of maximum service and win the good-will of the home managers.

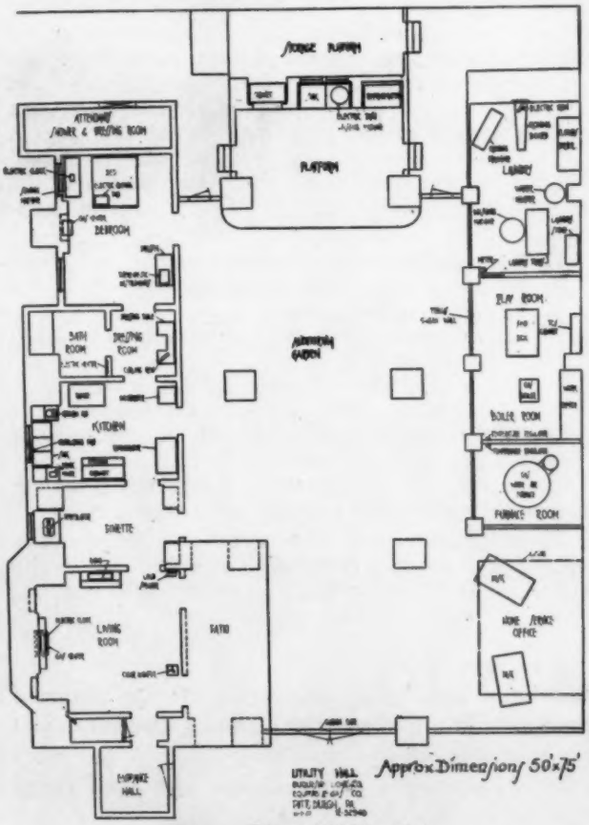
Trained women in the home service departments serve as the homemakers' direct representatives in the businesss field. Possessed of a sympathetic understanding of the homemakers' problems, these women are in a position to give invaluable service to those women whose business it is to keep the home.

In spite of the fact that home making is the greatest single industry, fewer women are trained for entering this business than for any other. As a consequence, this lack of training has made house-

View of entrance to home in Utility Hall

keeping for many women a drudgery, rather than a business to be managed as such.

Strangely enough, the development of labor-saving appliances has not resulted from a demand on the part of housekeepers. It is only with the passing of the maid-of-all-work that women have begun to consider the practicability of injecting some of the business man's efficiency into this business of home



Plan of Utility Hall

making and thereby lessening its drudgery. The ideal home maker wishes to manage her home well and yet have a certain amount of leisure to devote to creating a wholesome, joyous environment for those she loves. And then protecting the home that she has thus built by taking an active interest in civic matters of the community in which she lives.

What a Home Must Provide

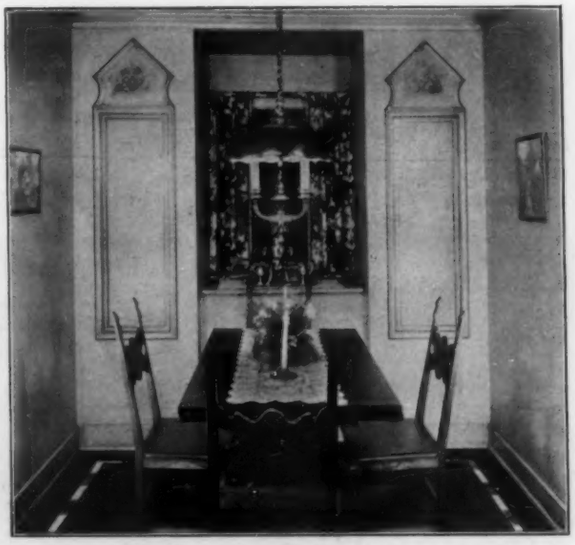
The material necessities that a home must provide are food, shelter and clothing. Of the average income, by far the largest percentage is spent for food. The health and happiness of a family depend on it. Experienced homemakers when asked what one thing more than any other contributed to successful home making will almost invariably answer, "Good cooking."

Cooking is an art and a science and should be appreciated as such. But unless we can relieve the monotony of three meals a day with the attendant drudgery of dishwashing, by showing simpler, shorter methods or by stimulating the imagination to creating new dresses for old foods, or by showing how housekeeping may be put on a more business-like basis, by budgeting both time and money, the housekeeper will have none of us and we are wasting our time and money. For how can we counteract living out of a tin can or a delicatessen unless we can show something better to make the extra effort worth while?

Because of the wide appeal of the cooking demonstration, it is a very good method to arouse interest. The interest, once aroused, can be guided along other lines to include labor-saving appliances and those appliances which bear on home comforts and sanitation, such as central househeating, hot water heaters and laundry appliances. Good home lighting can be approached from the standpoint of interior decorating.

Women Unused to Mechanical Devices

Individual instruction in the home is a big single factor in the use of appliances. Women are unused to mechanical devices and often grow impatient in learning their operation. Many a woman has said, "Oh, I can do this faster by hand," simply because it was necessary to unlearn an old method which had become more or less of a habit and learn a new method which, though it might take as long as the old way, yet used no human energy. Or an enthusiastic sales person might oversell the appliance, in which case miracles are sometimes expected, and failing to materialize, the appliance is not kept in use.



Breakfast room in Utility Hall home

In Utility Hall a great deal of our activity centers on the food lecture. Yet underneath it all, though we do wish to help women with their food problems, is a desire on our part to establish confidence in the company so that women will bring their grievances whether real or fancied, to be ironed out. High bill complaints, poor service, low voltage, low gas pressure, and all the other difficulties are turned over by

the Home Service Bureau to those departments that are responsible. So that we place first of all as the purpose for which Utility Hall was established: To build better public relations with the consumer.

Utility Hall Is Proving Its Worth

We have in Utility Hall a model home that is beautiful enough to interest every homemaker, no matter what her station in life, yet within the means of an average income. Here appliances are shown in their proper setting as they would appear in the home and arranged with the idea of saving steps for the busy housewife. That the women of Pittsburgh are alert to the opportunity afforded them in Utility Hall is evidenced by the fact that at the time of writing 20,000 women have visited Utility Hall since its opening on October 3rd. Our lecture demonstrations began October 14th. Lectures are given every Monday, Wednesday and Friday afternoons, and in four weeks 1,200 women by actual enrollment have attended the lectures.

The work of home instruction is carried on by four young women especially trained in the inspection and adjustment of gas and electric ranges and other major household appliances. Over a period of eight months something over a thousand home visits have been made. All the information that the housewife needs to know in order to intelligently operate her new appliance is given, as well as suggestions for its wider usefulness.

In addition to lecture demonstrations and home instruction, we are equipped to assist our testing laboratory in experimental work on appliances, the Home Service Bureau, of course, working from the housewife's viewpoint, for, while every housewife wants appliances that are safe, efficient and economical, she also wants to know in what ways it will best suit her needs.

The Home Service Bureau does not attempt to sell appliances in the sense of actually writing an order. Appliances are made desirable by showing their usefulness and efficiency. Prospect names are turned over to that division of the General Sales Department concerned with retail sales. Price tags are not attached to any appliances, but prices are always quoted to those persons who wish to know.

Though we place as our first purpose the establishing of better relations with the consumer, the purpose for which Utility Hall was built is fourfold:

1. To build better public relations.
2. To increase gas and electric sales.
3. To build domestic load—
   (a) by stimulating more constant use of appliances.
   (b) by creating new uses for appliances.
   (c) by encouraging purchase of appliances.
   (d) by education for logical and natural uses of gas and electricity.
4. To help the homemakers create more perfect homes through better cooking and housekeeping.

These are our aims and purpposes. The success, however, of Utility Hall will be judged not by its aims, but by the nature of the results achieved.

CHRISTMAS WINDOW

Here is a window that may give some gas man an idea. It, as you will note, is symbolic of the season—the range in a Christmas package, a Christmas tree and the Three Wise Men and the little city of Bethlehem as a background—this window attracted thousands in a midland city. During December and the time this window was being used the gas company was giving a set of dishes with each range purchased.

You'll sell more Gas Ranges if you sell one or more of these six famous makes

QUICK MEAL
DANGLER
DIRECT ACTION
CLARK JEWEL
NEW PROCESS
RELIABLE

Equipped with the famous

LORAIN

It's *More Profitable* for You to Sell Red Wheel Gas Ranges

A PROBLEM today with most merchants is to get more people to come to their place of business. Probably the quickest and the easiest way to do this is to slash the selling price of your merchandise to a point where there is no longer any profit in it for you.

The next method in order of importance, and the better way, is to sell merchandise that can be classified as famous in one respect or another.

The six brands of gas ranges equipped with the famous Red Wheel Lorain Oven Heat Regulator, and which are manufactured by American Stove Company, are undoubtedly the most famous products in their line.

The several brand names were well established and stood for quality merchandise when the oldest of us were still in school. For many, many years these trade names grew in importance in the public mind through sheer merit of the products themselves and through the reputation of American Stove Company for square dealing.

Then, nearly nine years ago, on top of this solid foundation, American Stove Company began to build a huge structure of public good-will through national advertising.

This structure of national advertising built around and about the Lorain Oven Heat Regulator had revolutionized the design and construction of gas ranges, has made the business more profitable and of far wider scope, and has been the greatest factor in the public's present day acceptance of gas as the ideal fuel for home cooking.

Today the six makes of ranges manufactured by American Stove Company and the famous Red Wheel Regulator with which they are equipped are known the world over. Scarcely a woman lives who intends to buy a gas range that cannot be sold a Red Wheel Gas Range in less time and with less effort than any other make.

This is true because the millions of dollars that have been spent on advertising Red Wheel Gas Ranges have, without question, performed the most difficult part of the task of selling, namely, making the product immediately acceptable to the public.

There may be very good reasons why you believe it to be more profitable for your clerks and yourself to spend your good time convincing a woman that some unknown brand of gas range is as good as a Red Wheel Gas Range.

But, we believe that you will find it more profitable and that your trade will be better satisfied if, upon their first inquiry for a new gas range, you lead them directly to one equipped with the Red Wheel, without the slightest necessity for excuses, reasons or vague explanations for handling them to the exclusion of all other makes. At least, try this plan for a time and judge for yourself.

AMERICAN STOVE COMPANY

801 Chouteau Ave. :: **St. Louis, Mo.**

World's Largest Manufacturers of Gas Ranges

THESE FAMOUS GAS RANGES ARE EQUIPPED WITH LORAIN:

DIRECT ACTION	NEW PROCESS	CLARK JEWEL
DANGLER	QUICK MEAL	RELIABLE

10-11-12-27

stet . . (of all things) . . by w. h. Emm

There's five whole days between Christmas and the New Year in which to get ready to lick the Presidential Year Depression—perhaps it's only a state of mind and you'll win out if you get your 1928 plans to percolatin' on January second.

Christmas time is the time to sell kindred appliances, and while the gas man in the smaller cities has not gone into this type of merchandising to any extent they all have "kindred appliances" for sale. Now is the time that they can afford to give some of their newspaper space and window space to this small related merchandise. Bring folks into your store to buy small appliances and then sell them major ones. In your window and floor display of this merchandise suggest its use as gifts or prizes. You will be surprised what a quantity of it you will be able to sell and, after all, it all helps make satisfied customers and friends for the company by acquainting folks with the gas man.

Here is a holiday window that the gas man in any town in the U. S. A. may build in an hour—a gas range for mother's kitchen and mother's comfort, a gift for the whole family. Radiant heaters, a little cotton, some artificial snow and some tinsel, with a few window cards and the window lighted well at night will arrest attention—and it's seasonable, it will bring folks in and you will sell more appliances.

Have a Customer's Corner in your store; provide free telephone service; have it furnished with an easy chair or two; tell the home manager to have her friends meet her at the gas office—bring folks into your store, bring them in, bring them in, bring them in. We say expose your merchandise to sales and you will not need to study the "trend of business maps." The trend of business is ever toward the place which caters to folks' comforts—that is, exposing new home labor-saving merchandise in pleasing settings.

The Economical Hot Water Club is the name of an organization newly created by the Welsbach Company. Members of this club are composed of users of self-action gas water heaters—a member is in good standing only so long as he lives up to the by-laws, which are as follows:

"1. No member shall turn on the hot water faucet when cold will suit his purpose as well.

"2. All members shall see that the hot water faucets are turned off tight after using.

"3. Any member who discovers a leaky faucet shall report the same to the family manager immediately.

"4. All members shall mix cold water with hot in order to get the right temperature instead of drawing twice as much hot water and then waiting for it to cool.

"5. Any member breaking the above rules shall be immediately demoted to the end of the bathroom line."

The 49th State Blue Star Group is an organization formed by a group of midwestern gas men to promote the American Gas Association's Blue Star movement in what is popularly known as the 49th State, an area about St. Louis, Mo., 150 miles in diameter. The officers of the group are: W. L. Jones, manager of the St. Louis County Gas Co., chairman; Wm. H. Matlack, advertising and sales manager of the Illinois Power & Light Corporation, East St. Louis, Ill., vice-chairman, and J. J. Burns, the Laclede Gas Light Co., St. Louis, secretary.

Blank & Stoller

H. L. Whitelaw
Chairman, Manufacturers Section

Alexander Forward
Managing Director

Blank & Stoller

E. F. Gardiner
Chairman, Publicity & Advertising Section

C. E. Paige
Treasurer

O. H. Fogg
President

B. J. Mullaney
Vice-President

Edward Porter
Chairman, Accounting Section

A. G. A. Officers and Section Chairmen

F. C. Mackey
Chairman, Industrial Gas Section

In addition to the chairmen shown Walter C. Beckjo·d will serve as Technical Section Chairman, J. J. Burns as Commercial Section Chairman and N. C. McGowen as Natural Gas Chairman

FINANCIAL NEWS

DIVIDENDS DECLARED BY GAS COMPANIES

Company	Rate	When Payable
American Power & Light com. (quar.)	$0.25	Dec. 1
Associated Gas & Electric original pref. (quar.)	$0.87½	Jan. 1
7% pref. (quar.)	$1.75	Jan. 1
Blackstone Valley Gas & Elect. common (quar.)	$1.25	Dec. 1
Preferred	3%	Dec. 1
Brooklyn Union Gas (quar.)	$1.25	Jan. 3
Central Gas & Electric Co. pref. (quar.)	$1.75	Dec. 1
Consolidated Gas (N. Y.) pref. (quar.)	$1.25	Feb. 1
Consolidated Gas, El. L. & P. (Balt.) common (quar.)	$0.75	Jan. 3
Preferred, Series A	2 %	Jan. 3
Preferred, Series B	1¾%	Jan. 3
Preferred, Series C	1⅝%	Jan. 3
Preferred, Series D	1½%	Jan. 3
Duquesne Light Co. 1st pref. A (quar.)	1¾%	Dec. 15
Empire Gas & Fuel 8% pref. (mo.)	$0.66 2/3	Dec. 1
7% pref. (mo.)	$0.58 1/3	Dec. 1
Essex & Hudson Gas Co.	4%	Dec. 1
Federal Light & Traction common (quar.)	$0.20	Jan. 3
Common (payable in common stock)	$0.15	Jan. 3
Preferred (quar.)	1½%	Dec. 1
Gas & Electric Securities common (mo.)	$0.50	Dec. 1
Common (payable in common stock)	¾%	Dec. 1
Preferred (mo.)	$0.58 1/3	Dec. 1
Hudson County Gas Co.	4%	Dec. 1
Laclede Gas Light common (quar.)	3%	Dec. 15
Preferred	2½%	Dec. 15
Prior Lien (quar.)	$1.75	Dec. 1
Los Angeles Gas. & Elec. pref. (quar.)	1¾%	Nov. 15
Louisville Gas & Electric (Del.) A & B (quar.)	$0.43¾	Dec. 24
North American Co. common (quar.), payable in com. stock	2½%	Jan. 3
Preferred (quar.)	$0.75	Jan. 3
Oklahoma Gas & Electric pref. (quar.)	1¾%	Dec. 15
Paterson & Passaic Gas & Electric	2½%	Dec. 1
Pennsylvania Gas & Electric, Class A (quar.)	$0.37½	Dec. 1
Class A (extra)	$0.03¾	Dec. 1
7% pref. (quar.)	1¾%	Jan. 1
Peoples Gas Co. pref.	3%	Dec. 31
Public Service Corp. of N. J. com. (quar.)	$0.50	Dec. 31
8% pref. (quar.)	2%	Dec. 31
7% pref. (quar.)	1¾%	Dec. 31
6% preferred (mo.)	$0.50	Dec. 31
Public Service Electric & Gas 6% pref. (quar.)	1½%	Dec. 31
7% pref. (quar.)	1¾%	Dec. 31
Rochester Gas & Electric 7% pref., Series B (quar.)	1¾%	Dec. 1
6% pref., series C (quar.)	1½%	Dec. 1
6% pref., series D (quar.)	1½%	Dec. 1
South Jersey Gas, Elec. & Power	4%	Dec. 1
Southern California Gas (quar.)	$0.75	Nov. 15
Standard Gas & Electric 8% pref. (quar.)	$1.00	Dec. 15
Standard Gas & Elec. (Del.) common (quar.)	$0.87½	Jan. 25
7% prior preference (quar.)	$0.87½	Jan. 25
United Gas & Electric Corp. common (quar.)	$1.00	Dec. 8
West Ohio Gas preferred (quar.)	1¾%	Dec. 1

Gas Companies' Earnings

American Light & Traction Co. (and subsidiaries) for 12 months ended Sept. 30, 1927, report gross income of $10,422,378 and balance after taxes and expenses of $7,173,100, as against gross of $9,709,956 and balance of $7,773,546 for same period in 1926.

Associated Gas & Electric Co. reports for 12 months ending Aug. 31, 1927, gross earnings of $33,152,610 and net balance of $1,413,908 as against gross of $27,464,011 and net balance of $1,686,088 for preceding 12 months.

Atlantic City Gas Co. reports gross earnings of $1,708,279 and net income of $418,157 for year ended Dec. 31, 1926.

Binghamton Light Heat & Power Co. for 12 months ended Sept. 30, 1927, reports gross income of $2,112,887 and net income of $310,595, as against gross of $1,862,711 and net income of $202,376 for preceding 12 months.

Blackstone Valley Gas & Electric Co. for 12 months ended Sept. 30, 1927, reports gross earnings of $5,891,095 and net balance of $1,510,975, as against gross of $5,383,015 and net balance of $1,385,048 in preceding 12 months.

Cities Service Co. for 12 months ended Sept. 30, 1927, gross earnings of $2,797,315 and net to common sock and reserves of $1,927,421, as against gross of $2,139,926 and net of $1,289,289 for preceding 12 months.

Columbia Gas & Electric Corp. (and subsidiaries) for 12 months ended Sept. 30, 1927, reports gross earnings of $96,746,522 and net income of $23,772,807, as against gross of $91,464,131 and net of $25,951,322 for preceding 12 months.

Consolidated Gas, Electric Light & Power Co. (Balt.) for 9 months ended Sept. 30, 1927, reports gross income of $18,241,470 and net surplus of $1,466,961 as against gross of $18,190,183 and surplus of $1,860,554 for preceding nine months.

Fall River Gas Works for 12 months ended Sept. 30, 1927, reports gross earnings of $1,045,636 and net of $262,907, as against gross of $993,419 and net of $217,695 for preceding 12 months.

Federal Light & Traction Co. (and subsidiaries) for 12 months ended Sept. 30, 1927, reports gross revenues of $6,915,666 and net balance of $1,660,770, as against gross of $6,432,434 and balance of $1,492,903 in preceding 12 months.

General Gas & Electric Corp. (and subsidiaries) for year ended Sept. 30, 1927, reports gross revenue of $25,362,856 and surplus of $1,439,119, as against gross of $23,196,613 and surplus of $1,244,570 in preceding period.

Laclede Gas & Electric Co. (and subsidiaries) for 12 months ended Sep. 30, 1927, reports gross earnings of $9,079,707 and net income of $1,206,527.

Los Angeles Gas & Electric Corp. for 12 months ended Sept. 30, 1927, reports gross earnings of $1,321,137 and net of $130,163, as against gross of $1,176,627 and net of $157,558 for preceding 12 months.

Midway Gas Co. for 12 months ended Sept. 30, 1927, reports operating revenue of $3,874,001 and net of $767,938 as against revenues of $4,628,377 and net of $728,298 in preceding 12 months.

North American Light & Power Co. (Del.) for year ended Sept. 30, 1927, shows gross earnings of $36,888,668 and surplus of $1,596,395 as against gross of $33,112,933 and surplus of $1,258,568 for preceding period.

Pacific Gas & Electric Co. for nine months ended Sept. 30, 1927, shows gross revenue of $40,835,215 and net balance of $8,113,477, as against gross of $37,835,450 and net balance of $6,127,785 for preceding nine months.

Peoples Gas Co. reports gross earn-

ings of $607,409 and net income of $98,-134 for 12 month ended Aug. 31, 1927.

Public Service of New Hampshire reports gross revenue of $3,966,731 and net income of $1,019,842 for year ended Sept. 30, 1927.

Public Service Corp. of New Jersey for 12 months ended Oct. 31, 1927, shows gross earnings of $113,549,021 and balance for dividends and surplus of $13,571,671 as against gross of $104,-412,352 and balance of $13,104,226 for preceding 12 months.

Roanoke Gas Light Co. reports gross earnings of $435,310 and net income of $90,945 for 12 months ended Aug. 31, 1927.

Southern Indiana Gas & Electric Co. for 12 months ended Oct. 31, 1927, reports gross earnings of $3,030,768 and balance of $364,336, as against gross of $2,845,981 and balance of $268,448 for 12 months preceding.

Southern United Gas Co. reports gross earnings of $692,007 and balance of $315,699 for year ended June 30, 1927.

Union Electric Light & Power Co. (St. Louis) for 12 months ended Sept. 30, 1927, shows gross revenues of $18,-348,872 and balance of $4,813,353, as against gross of $17,116,916 and balance of $3,647,251 for preceding 12 months.

Wilmington Gas Co. reports gross earnings of $1,245,722 and net income of $253,812 for year ended Aug. 31, 1927.

SUMMARY OF NEW CAPITAL FLOTATIONS OF GAS COMPANIES DURING NOVEMBER, 1927

Company and Issue	Purpose of Issue	Price	To Yield About %	Amount
American Natural Gas Corp.				
$7 cumulative conv. pref. stock (without par value)	Corporate purposes	99.50	7.00+	*50,000
American Commonwealths Power Corp.	Acquisition and			
1st. pref. $7 cum. div., series A (without par value)	Corporate purposes	96.00	7.25	*15,000
Central Indiana Gas Co.				
6½% cum. pref. stock	Corporate purposes	97.50 & div.	...	$500,000
Central Public Service Co.				
$7 cumulative pref. stock (no par value)	Corporate purposes	$100.00 & div.	...	*15,000
Cities Service Power & Light Co.	Add'l working capital			
5½% gold debentures due 1952	& Corp. purposes	98.00 & int.	5.65	$45,000,000
Empire Gas & Fuel Co.				
7% cumulative preferred stock	Addns. & impmts.	$100.00	7.00	$10,000,000
Florida Public Service Co.				
1st mortgage 6% gold bonds, series A, due 1955	Corporate purposes	$101.00 & int.	5.90	$1,814,000
Illinois Power & Light Corp.				
1st & ref. mtge. 5% 30-year gold bonds, due 1956	Corporate purposes	$98.00 & int.	5.13	$5,000,000
Midland Utilities Co.				
6% cumulative prior lien stock (par $100)	Corporate purposes	$95.00	6.31	*25,000
Mississippi Power & Light Co.				
1st mortgage gold bonds, 5% series, due 1957	Corporate purposes	97¼ & int.	5.14+	$9,000,000
Montana Cities Gas Co.				
1st mortgage 7% sinking fund gold bonds, series A, with stock purchase privilege	Corporate purposes	100.00	7.00	$1,500,000
Oklahoma Gas Utilities Co.				
1st line, 7 yr. 6½% sink. fund gold bonds, series A	Corporate purposes	100.00 & int.	6.50+	$800,000
Philadelphia Suburban Counties Gas & Electric Co.				
1st & ref. gold bonds, 4½% series, due 1957	Ref. & impmts.	98.00 & int.	4.63	$10,000,000
Public Service Electric & Gas Co.				
1st & ref. mtge. gold bonds, due 1967, 4½% series	Ref. & betterments	98.00 & int.	4.60+	$45,000,000
Southwest Gas Co.				
5 yr. mtge. sinking fund gold notes, series A	Corporate purposes	100.00 & int.	7.00+	†500,000
Union Gas Utilities, Inc.				
10 yr. 6½% secured gold bonds, series A (with stock purchase warrants)	Corporate purposes	98.00 & int.	6.75+	$3,000,000
Wisconsin Hydro Electric Co.				
1st mtge. 5% gold bonds, series of 1947	Corporate purposes	95½ & int.	5.37	$2,000,000

* Shares. † Sold privately.

"A Brief History of the Natural Gas Industry"

By H. C. ZWETSCH
1927 Edition
Copy sent upon request

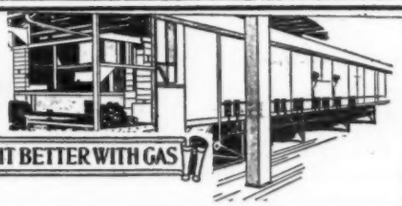
Zwetsch, Heinzelmann & Co.
Inc.

Specialists in Natural Gas Securities

57 William Street New York

INDUSTRIAL GAS

IF IT'S DONE WITH HEAT YOU CAN DO IT BETTER WITH GAS



"Pay Dirt"

A "Mine" of Precious Metals Is Found in Sweepings and Filings

By Jos. W. Piatt

"Gold! Gold! Gold! Gold!
Bright and yellow, hard and cold,
Molten, graven, hammered and rolled;
Heavy to get and light to hold."

—Thomas Hood.

A FIRM in a large eastern city is engaged in gold and precious metal recovery and refining. This means getting the silver, palladium, gold, platinum and iridium out of the baser metals, ores and waste materials.

The firm was organized about forty years ago and enjoys a world-wide trade. Its business has grown rapidly and steadily until now it is a leader in this line of endeavor. The refinery was modest in size at first, but now it occupies the better part of a city block, its capacity permitting of carrying out operations on a large scale.

Recovering lost values that lie in floor cracks, ceiling and wall crevices and the sweepings of jewelry workshops, silverware factories, dental laboratories, and, in fact, wherever precious metals are worked is a science which has been brought to a high state of perfection by this well-known smelting and refining firm which has a record for efficiency extending over thirty-two years. Once the waste dump received the sweepings and filings of jewelers and silversmiths, no attention being paid to the wealth destroyed in this manner. Now, not a particle is lost, even the smallest grain of gold, silver or platinum being recovered by this superior method.

What an asset this once discarded matter proves to be may be realized from the fact that as high as $300 per hundred pounds has been paid for sweepings, refuse which fifty years ago found its way to oblivion in city dumps.

High Pay for Waste Matter

Where this firm cleans up for customers at regular intervals it often paid several thousands of dollars for the products derived from the waste matter by their smelting and refining methods. This adds considerably to the prosperity of such customers, the formerly unlooked-for revenue from sweepings and filings being one of the big items of gain in the year's business, and it is obtained at small cost and without any outlay of energy.

This firm once sought to induce a manufacturer to let its men clean up his factory. He scoffed at the idea of it being worth while, but finally agreed. The place had not been thoroughly cleaned for several years, and consequently the accumulations of dirt were large. Several barrels of dirt were gathered up. Every board in the floor was lifted and scraped. Some of the boards had so many bits of gold and silver ground into them by the shoes of the workmen that they had to be carefully burned and the ashes added to the dirt to be refined. All the refuse was shipped to the smelting works and when the work was finished there was a profit of several hundred dollars left for the manufacturer who thought the dirt in his shop was not of sufficient value to pay for the labor of packing and shipping.

The values of the sweepings are ascertained in the assaying department, and the various stages of the process consist first of collecting the gold, platinum and silver in lead; next separating the lead from the combined mass of gold, platinum and silver; next separating the silver from the gold and platinum, followed by the elimination of the platinum from the gold. Each process is a replica on a small scale of the principles adopted in treating the bulk, but it is carried out with the greatest care and exactness, the balances used weighing to the one-thousandth part of a grain. For assaying sweepings a series of one-quarter ounce or one ounce samples are treated and a variation of a hundredth grain of gold in an ounce would mean a difference in the offer of $15 per ton.

Handling the Sweepings

Sweepings are first burned in specially built furnaces and the ashes carefully collected and ground to a fineness that permits of their passing through a 60-mesh sieve. The lot is then thoroughly mixed, thus insuring an equal distribution of the precious metals. After weighing a sample is taken and assayed. This assay will determine the exact amount and nature of metals contained per pound of prepared material.

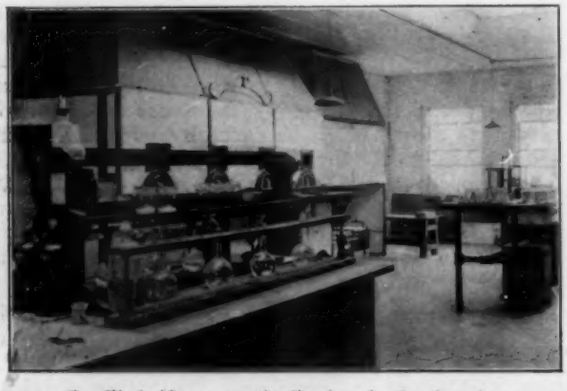
The different grades of sweepings are then thoroughly mixed in bulk in a large mixer. A check assay is made of the batch before smelting. The flux and litharge are then added in the mixer, and the entire lot put into a machine, which forms the mass into bricks. Everything is now ready for the actual smelting.

In the blast of the gas-fired smelter the litharge or lead soon starts to melt, carrying all particles of precious metals with it. The fluid mass floating on top of this lead is the flux, forming a slag containing all the impurities of the mass. This slag is drawn off at frequent intervals and on cooling is tested, and if it shows any values in precious metals is returned

to the smelter and re-run.

Lead Holds All the Precious Metals

The lead containing the precious metals is also drawn off when necessary, and on cooling put on a gas-fired cupel furnace for test. While in a molten state it is treated with a blast of air and the oxide which combines with the lead forms lead oxide or litharge, which is run off and again brought into use with the next lot to be smelted.



Gas Finds Numerous Applications in the Assaying Laboratory

When no more lead oxide forms the bullion left on the cupel is a mixture of the precious metals—gold, platinum, silver, iridium. This is allowed to cool and is then chiseled from the bed of the cupel, melted and run into bars, when it is ready for refining and separating into individual metals.

These bars are alloyed to assay about 60 per cent silver. They are melted into ingots or annodes of about 13 by 3 inches for the electrolytic refining of the silver, the first metal extracted.

The electrolyte that these annodes are hung into is kept agitated by a current of air run to the bottom of the tank through a glass tube while the electrodeposition of the metals is taking place. During the action of the current the silver only is dissolved and the gold is left in a muslin bag, hung around the annode, as a spongy material. The base metal enters the solution and is not deposited. The silver thus obtained is in a spongy form and when washed free, dried and melted can be obtained practically 995 parts fine.

The gold left in the bags in the form of sponge or finely divided material is then removed and melted into gold annodes for further refining. This process is done in porcelain tanks and a spongy gold is deposited on the cathode, which when washed free from the electrolyte and melted is of high purity and surpasses any obtainable by any other refining process and runs 999.5 fine.

Separating the Platinum

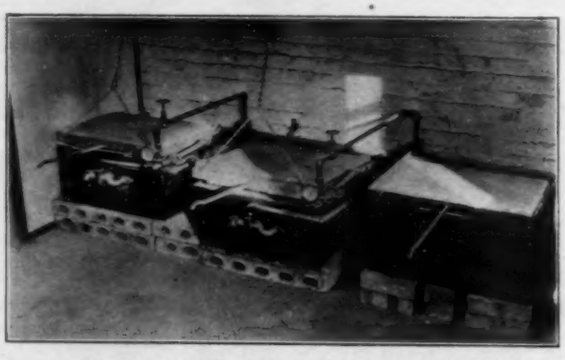
In the refining of the gold any platinum or palladium will go into the solution and remain there. This is afterwards treated with sal ammoniac and the platinum is precipitated as ammonium platinic chloride, which is then washed, dried and melted under the gas blow pipe. The palladium is treated with potassium chloride and precipitated as red palladium ammonium chloride. These metals after being melted are ready for the market.

Silver, gold and platinum, three of the rare metals with which the average person has some acquaintance are found and secured originally only with the utmost difficulty and it is only in remarkably extreme and fortunate instances that the toil, hazard and privations endured do not more than fully balance the value of the precious metals found.

For the sake of gold men have braved deserts and have sifted and washed the sands of mountain valleys and river shoals. With maul and drill, with pick and shovel they have toiled and starved to be rewarded by a few handfuls of gold either in shining lumps or gleaming dust. Where gold is recovered by means of other processes from combinations of metals the amount of gold is comparatively small so that the accumulated stores of this precious metal represent accreations of many tiny portions poured into the treasure chests of civilization by millions of striving hands. The story of the acquisition of gold and platinum is the story of fevers, plagues, hunger, danger and death. Whole races of people have been put to the sword, continents subjugated, religions and civilizations destroyed and physical devastation wrought upon many parts of the earth for the sake of gold. Considerable portions of the vast accumulation of the precious metals that the modern world possesses have been inherited from very remote times.

Gold in Ancient Times

While the first gold and silver mines were probably in India, the earliest specific mention of gold or silver mining in European history is found in the story of Cadmus, a Phoenician, who mined copper and gold in Thrace about 1594 B. C., and who carried thither the alphabet.



Gas Fired Melting Furnaces For Precious Metals

Beginning 1200 B. C. the ancient Phrygians worked the auriferous sands of the Pactolus now known as the Sarabat River, which flows near modern Smyrna. These placers were the source of the

wealth of Croesus, Midas and Pytheus, the last of whom in his greed for gold condemned vast numbers of his own subjects to the mines. At the time of Xerxes' invasion, 470 B. C., Pytheus had nearly $20,000,000 worth of gold and silver.

The Phoenicians worked the gold placers of the Guadalquiver, in Spain, previous to 1100 B. C.

The first use of precious metals as money is commonly assigned to Greece, about 900 B. C., but there are reasons for believing in an earlier use in India and other regions. The Babylonian stater—three parts gold and one part silver—is the first known stamped coin, and dates back to 700 B. C., although gold and silver coins are said to have been used in Egypt during the era of Menes, nearly six thousand years ago.

In the stock of gold which has come to us from antiquity, a small portion was derived from the outcroppings of ancient quartz mining in Siberia, Egypt and Greece. Great cruelties and sacrifice of life attended the working of these mines. In Siberia the ancients had no better tools than wedges and hammers, and had to lie flat to get at the quartz, from which they picked small filaments of metal with the sharpened fangs of boars.

Source and Antiquity of Silver

The principal portion of the silver of ancient times came from Spain, where the mines were worked by the Carthaginians from 480 B. C. to 260 B. C. The product was conveyed to Carthage and the bulk of it was finally captured and carried to Rome. Spain was to the ancients what Mexico and Central and South America became in later ages to Spain—the Dorado, the place where gold and silver were found in great abundance.

From 1680 to 1807 nearly $1,250,000,000 worth of gold was taken away from Brazil. And even half of that vast country is still unexplored. In the early mining days of Brazil food was scarce, corn selling for $250 a bushel and meat, including bones, selling for an ounce and a half of gold (about $30) per pound. It required all the gold the mines could obtain to keep them in food, and even this was insufficient, for great numbers of them died from leprosy and starvation. As a rule, the gold hunters all died poor—their lives wasted in the hardships inseparable from gold hunting in regions where food was scarce and difficult to procure.

While a mill race was being dug on the Sacramento River in 1848 a child found a lump of gold which she showed to her father as a pretty stone. That lump was the beginning of the three billion dollars worth of gold which came from the California placer mines. Soon gold was found in Nevada and the output became enormous. Large quantities of silver were also mined. Later precious metals were found in varying but extensive quantities in many other western states.

Platinum is a grayish white metal distinguished by its great specific gravity and difficult fusibility. Its modern discovery took place in South America and it was taken from there to Europe in 1735. It appears in the native state alloyed with palladium, rhodium, iridium, osmium, and ruthenium, and a little iron, in the form of small flattened grains; sometimes in larger nodules, alloyed with gold and traces of silver and with copper, iron and lead. It is usually found in the gravel of river beds, in the debris of the earliest volcanic rocks, in Russia, Brazil, Santo Domingo, Borneo, Ceylon, California and Australia. It was at first described as "white gold."

Although it was not until the 18th century that platinum attracted general attention, it is now certain that this metal was known to the ancients. An alloy of platinum, gold and iridium composing some of the hieroglyphs on an Egyptian box at Thebes, dating from the 17th century B. C., has been found.

In 1819 white grains were discovered in the auriferous sands of the Ural Mountains. In 1823 a French expedition found this to be platinum. Since that time the Ural district has supplied the greatest share of this metal.

Iridium, the hardest and heaviest of metals, is so called because of the varying tints in its salts when passing from one state of oxidation to another. It is a metal of silverwhite color, belonging to the platinum family, and it is always present in native platinum. Iridium also occurs combined with osmium and rhodium. It is always found in small grains.

Little is known of the qualities of iridium, other than is found in the details of its artificial preparation. It has never been obtained free from other metals. Because of its hardness it is used extensively in the points of gold pens, that being the chief reason why they do not wear out.

What We Owe the Alchemist

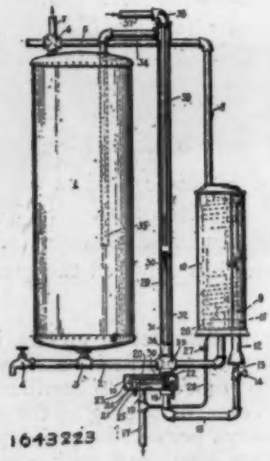
When one reflects how silver, gold, platinum and other precious metals are procured the salvage processes of previous metal refiners are obviously a service to civilization. By the invocations of heathens and through the mysteries of the magicians some spell of witchery has been sought by which stores of precious ores would be revealed to the needy. The alchemist and philosopher of old strove to find some method of transmuting base metals into gold and actually accomplished results in separating gold from other metals with which it was found. They laid the foundations upon which modern chemistry has developed and assisted in the betterment of the world in a multitude of ways.

Gas itself is the product of modern science and chemistry, and therefore owes its token of deference to the ancient alchemists and philosophers whose search for synthetic gold finally made man master of the greater energies that serve him faithfully today.

Patents of Interest to the Gas Industry

Water Heating System

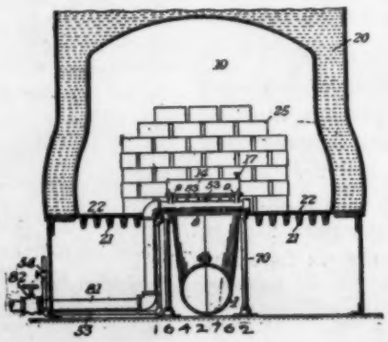
The storage tank 1 is connected by the circulating pipe 8 to the heater 10. A flow pipe leads from the heating unit to the tank and a return pipe leads from the tank to the heating unit. A thermostat is shown at 23. This controls the action of the heating appliance. The



thermostat is shown connected by means of the pipe 2 with the bottom of the tank 1. This pipe is also provided with the branch pipe 29 which connects with another pipe which extends down into the tank 1 to a predetermined level below its top. Patented by H. W. O'Dowd, Jersey City, N. J., and assigned to Standard Gas Equipment Corp. U. S. Patent No. 1,643,223. Filed September 23, 1925.

Burner For Heating Apparatus

The burner mechanism consists of an air conduit 1 which opens up into the combustion chamber of a heating apparatus. This conduit is constricted in its approach to the chamber. Means are provided for introducing liquid fuel into the conduit in the region of constriction and from above and means are also provided for introducing another gaseous substance into a stream of air which flows in the conduit in the region of constriction and in the direction of flow. J. B. Anderson and J. B. Garner, Pittsburgh, Pa., assignors, Peoples Natural Gas Co., Pittsburgh, Pa. U. S. Patent No. 1,642,762. Filed November 16, 1926.

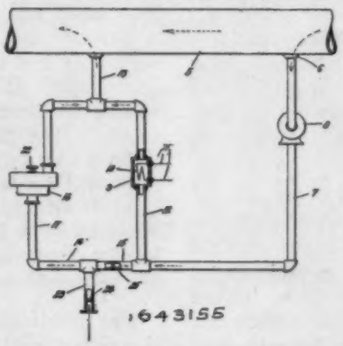


Fitting for Gas Pressure Gauges

The illustration shows a pressure gauge, comprising tubular gauge elements and a gas pipe 11 adapted for making connection with the pipe in which the pressure is to be ascertained. A flexible fitting is connected to the opposite ends of the gauge at 15. This fitting forms a tie between the gauge elements and the gas pipe. Patented by P. Goodman, Brooklyn, N. Y., in U. S. Pat. No. 1,643,886. Filed February 23, 1927.

Gas Analyzing Apparatus

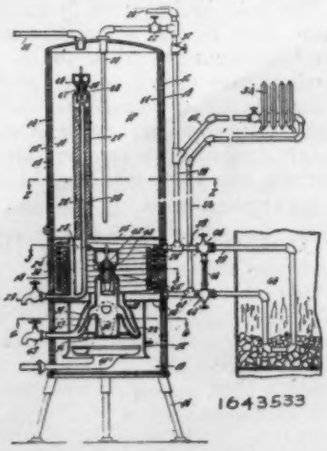
The gas pipe from which the sample of gas is withdrawn for analysis is in-



dicated at 5 in the figure. The gas is drawn from this pipe at 6 through a suction device 8 into the pipe 7 and then through the analyzing apparatus. The gas is returned to the pipe through the tube 13. The catalytic analyzing apparatus is shown at 9. The gas sample is passed through this apparatus by means of the pipe 12. Means are connected with this device for supplying a fluid combustion supporting medium. Means are also provided for regulating the pressure so that a constant difference in pressure exisits between the fluid supply and the gas conductor pipe. R. Eisenschitz, Friedenau, Berlin, Germany, assignor, by mesne assignments, Bailey Meter Co. U. S. Patent No. 1,643,155. Filed December 31, 1926.

Water Heater

The water heater shown in the accompanying illustration is divided by the partition 15 into an upper water storage compartment and by the partition 16 into an intermediate coil compartment and a lower burner compartment, 19. The cold water supply pipe 21 extends into the upper compartment 17. The coil in the intermediate compartment is shown to be made up of an inner and outer section. The outer section is connected with the cold water storage compartment 17 and receives a supply of cold water from that source. A pipe, 27, leads from the inner coil sections and extends almost to the top of the upper chamber 17. A water back is provided, making connection with the bottom of the intermediate coil compartment. This receives the cold water that



is adapted to be contained in it. An outlet is provided in the water back arranged near the top of the coil compartment, shown at 42. Hot water is thereby caused to circulate within the coil compartment to heat up the coils and to heat the water which passes through them. The burner is shown at 41, and is located directly under the water back 35. The hot water is drawn off from the storage compartment through the outlet pipe 51. Patented by A. E. Ania, Corona, N. Y., in U. S. Patent No. 1,643,533. Filed March 24, 1926.

THE BIGGEST

news

in Gas Ranges of the Century

ROPER Scores a "Smashing First"

Turn over—*and read the story of Roper's sales-speeding sensation*

NEW

ROPER COLOR RANGES

No. 700 R6 T3

HERE'S the biggest sales-making, profit-increasing booster that has come to the dealer in gas ranges in many a year . . . *Roper Color Ranges*—Roper ranges in brilliant, lustrous hues to match artistically into the latest decorative feature of modern homes, the kitchen furnished and equipped even to enamel ware in harmonious tints and shades of one color . . . Roper has produced the one and all important item in kitchen furnishing and equipment to give complete color harmony . . . We have brought forth color ranges — beautifully enameled in four striking colors—Delft Blue, Imperial Red, Canary Yellow, and Jade Green . . . With this spread of color, Roper has a range to fit harmoniously into any color scheme planned for a kitchen.

Put Your Stock of Ranges in Tune With Kitchen Color Harmony

THIS big innovation in the home means money to you. It will speed replacement of old ranges, and lift the price a customer will pay for a range; for the housewife is buying more than equipment for the kitchen. She is buying beauty for her home.

The demand for color in ranges will soon be on you. If your display does not have color ranges, your patrons will know it is not an up-to-the-minute stock.

Wire your initial order for Roper Color Ranges. The ranges available for display at the start will be limited. Write for the full story of the newest and biggest stride in gas range merchandising history.

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ROPER

GAS RANGES

in Color

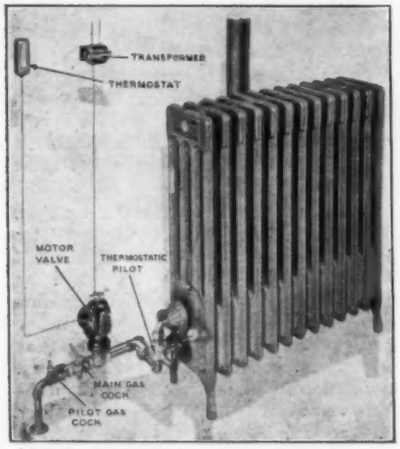
BLUE RED YELLOW GREEN

Equipment News

Thermostatic Control With Gasteam Radiation

Clow Gasteam Heating Systems can now be installed in connection with a thermostatic heat regulator.

For residence and other buildings of the better class, the thermostatic control system with Gasteam radiators is second to none, and the cost of installation and operation is less than for a boiler system using gas or oil, equipped in the same manner.



For an installation of this kind a room temperature thermostat is placed in a centrally located room, and automatic pilots are installed on each Clow Gasteam Radiator. The electrical unit operates on an ordinary 110 volt house circuit. This thermostat can be set to maintain any room temperature desired. A clock type thermostat which changes temperatures automatically can be installed instead of a room temperature thermostat. No further attention is necessary to give the desired room temperature. Light the Gasteam radiators in the fall and turn them out in the spring. Practically no other attention is necessary. Thus, all heating drudgery and worry is eliminated entirely.

By installing a system of this type none of the economy of a unit heating system is lost, and at the same time the added comfort and convenience of automatically controlled room temperature is gained. In short, the Gasteam thermostatic system appears to be one of the highest developments in the heating field, because it combines all the advantages of gas heat, economical use of gas fuel by the unit system and absolutely automatic control.

For garage heating a system of this type gives utmost economy and convenience. In heating garages only a small amount of heat is required for only a short period of the year. Furthermore, it is essential that low temperatures are maintained, because when an automobile is driven into an overheated garage there is danger that the sudden change will cause the paint on the car to peel.

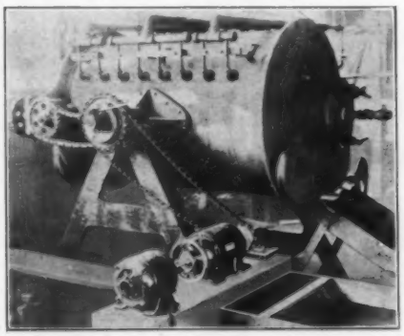
Variable Speed Transmission as Applied to Carburizing Furnace Drive

In classing this drive as difficult, a qualification is necessary as the actual installation of the carburizing furnace drive is extremely simple—yet the particular results which are obtained with the equipment are difficult to secure.

In the successful operation of the carburizing furnace it is often necessary to vary the slow rotation of the drum with a range of from about one to five revolutions per minute. To facilitate this control it is highly desirable to be able to change the speeds at will and with minimum effort on the operator's part.

In this installation the constant speed electric driving motor is direct connected to a JFS Variable Speed Transmission which in turn drives the rotating mechanism for the revolving drum.

The speed variation is all obtained with the JFS Speed Changer, which affords immediate and positive control of the rate of rotation simply by the regulation of a small hand wheel, conveniently located.

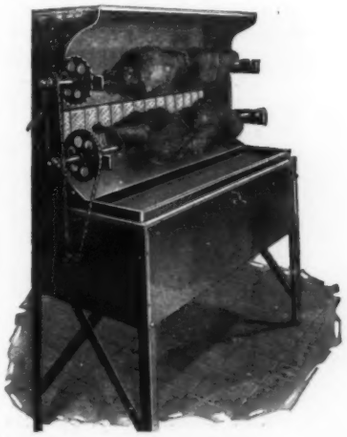


The JFS Variable Speed Transmission, which is the feature of this drive, is a compact unit, fully enclosed and no larger in size than the driving motor. All dust, grit and moisture is excluded from the mechanism by the case which completely houses the transmission. The lubricant is retained within the case, bathing all the parts in a constant supply of oil.

Smooth, quiet operation characterizes this machine, which assures full flexibility of operation over a range of variable speeds.

New Roadside Barbecue Unit

An improved automatic barbecue has been perfected with which hams, chickens, turkeys, quail, ducks, geese, beef and other meats and game can be roasted to a turn, retaining all of the delicious natural flavor and meat jjuices which give such an appetizing taste.



This new, automatic barbecue roaster is handsomely finished, sanitary and very efficient in operation. The outer case is of polished, solid stainless steel, which heat cannot affect. The gas burner is divided in the center so that either half can be lighted, independently of the other. The gas flame is one-quarter inch high, and when lighted the block is incandescent the full eight inches. The motor—1-20 h.p.—consumes 50 to 60 watts when operating at full load, but ordinarily operates at about one-half load and consumes 30 watts. If electric power is not available the barbecue roaster can be operated from a storage battery or gasoline engine. The installation comes complete (with or without legs) ready to operate. There are other models designed especially for the use of coal where gas is not available.

Either the gas or coal barbecue roaster may be enclosed in various types of attractive housings, with glass windows which protect meat, game, etc., from dust and flies.

Complete information about this new barbecue roaster will be mailed by the Illinois Iron & Bolt Co., Carpenterville, Ill., to any reader of this publication who is interested.

New Model Clow Gasteam Radiator Out

A new model Clow Gasteam Radiator —the Gothic six column—has been added to the Clow line of gas-fired steam radiators, and is now ready for distribution.

The Gothic six column has already

been tested and approved by the American Gas Testing Laboratory and by the National Board of Underwriters' Laboratories, as is the entire Clow Gasteam line.

The Gothic Gasteam Radiator has a high square foot radiation rating for the space it occupies. It is thirty-one inches high and it is expected that this new radiator will be popular because it can be placed under windows without preventing easy access to unusually low windows, at the same time providing a high square foot radiation rating.

Gas-Fired Boiler Serves Unique Purpose for Electric Railway

The Cleveland Electric Railway Company, Cleveland, Ohio, washes 35 single and 35 double deck buses every day during the winter with water heated by one gas-fired steam boiler.

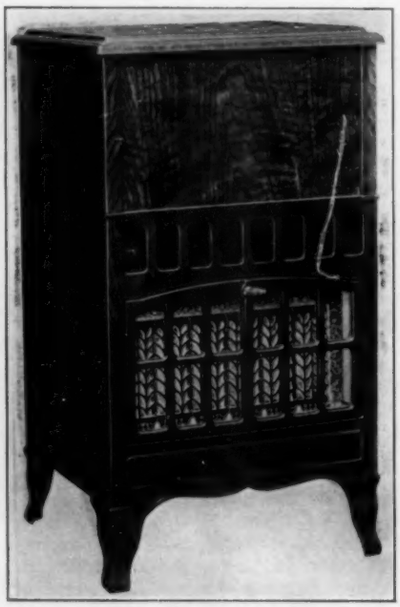
The boiler used is a 37 section Bryant. Its capacity is 19,250 gallons of water heated each day. To wash a single deck bus 250 gallons are used, and for a double deck bus 360 gallons.

In contemplating the installation of the gas-fired boiler, the Railway Company weighed its expense and advantages against those of municipal steam. There was doubt as to the effective piping of municipal steam for the distance it would have to be piped, and there was also the possibility of too low pressure. As ample heat was necessary at all times they chose the gas-fired boiler.

The satisfactory, carefree operation during the year and a half since its installation has proved beyond question the wisdom of their choice.

Heater Combines Circulating and Radiation Principles

The new Superior Circulator for gas is a unique development in house heating appliances. This beautiful heater, made by the Bridge & Beach Mfg. Co. of St. Louis, who have been manufacturing stoves since 1837, combines features of both the radiant heater and the cabinet circulator.



The Superior Circulator for gas is finished in walnut enamel in which the actual grain of the wood is faithfully reproduced.

Fully enameled inside and out, the Superior Circulator is made for durability and long and economical service.

This new heater is intended for heating the small home of three or four rooms with warm, circulating air, and the radiant heat and light from the front add a touch of cheer which is greatly appreciated by people who do not have the advantages of the open fire place.

Trade Catalogs

Elliott Company, Pittsburgh, Pa., Bulletin P is devoted to a description of their Centrifugal Blowers and Compressors. This well gotten-up bulletin of some thirty-two pages is replete with cuts illustrating the construction of this equipment, as well as actual illustrations in gas and industrial plants. In the back of the bulletin are several pages of curves and data that will be found useful.

The Victaulic Company of America, 26 Broadway, New York City, have recently published a new catalog which fully explains and describes the Victaulic Pipe Couplings and their application in actual service. Some novel installations are depicted.

The new catalog of Abendroth Bros., Port Chester, New York, describes the line of gas ranges, hot plates and laundry stoves manufactured by this company. The many refinements and improvements in the line, since the issuance of their last catalog, are amply set forth.

"Temperature Regulators and Other Specialties" is the title of a catalog just published by the Honeywell Heating Specialties Company of Wabash, Ind. This artistic and splendidly illustrated publication describes the Honeywell thermostatic control for gas and coal fired heating plants. In addition it shows some typical applications of these regulators.

American Gas Products Corporation, New York City, "Ideal Hot Water Supply Manual" is the title of a small 32-page booklet recently published by this company. This booklet contains some worth-while data on hot water heating and discusses such phases as ratings, estimation of fuel requirements, calculation of piping, etc. Actual problems are solved and tabular and other data are intelligently arranged. Those interested in gas house heating should have this booklet.

The latest catalog of Clow Gasteam Radiators is devoted largely to illustrating a great number of homes and business places where these units have been installed. Accordingly it should appeal to the gas commercial man. In addition to the above cuts there is a concise description of the Gasteam Radiators accompanied by several installation drawings. A copy will be sent upon application to James B. Clow & Sons, Chicago, Ill.

Bulletin 3A, American Gas Furnace Company, Elizabeth, N. J., describes this company's gas forges. In addition to listing a number of new forges, it contains a great deal more information than the old bulletin.

The Superior Meter Company, Brooklyn., N. Y., has recently published a small pamphlet having to do with their new Super-B Meters. This pamphlet literally and graphically sets forth a comparison of the capacity of the Super-B Meter with the A and B type meters.

An interesting folder has been published by the Brown Instrument Company, Philadelphia, Pa. This holder, "Eliminate the Human Factor," contains pictures and captions showing 13 different applications of Brown Automatic Temperature and Pressure Controls in as many different kinds of industries.

Taken from Previous Issues of the American Gas Journal

TEN YEARS AGO

The Southern Counties Gas Company filed an application with the supervisors recently for a franchise of forty years' duration to lay pipe lines along the highways in various portions of the county outside municipalities. An application recently made by the Economic Gas Company for a blanket franchise of a similar nature was turned down by the board.

The gas output of the Boston Consolidated Gas Company for November was 555,000,000 cu. ft., or 5.8 per cent more than that for November last year. The October output was 545,424,000 cu. ft.

George B. Cortelyou, president of the Consolidated Gas Company of New York, has been appointed a member of the War Savings Organization Committee for Greater New York.

M. G. Reynolds, president and general manager of the Reynolds Gas Regulator Company of Anderson, Ind., died Dec. 12. The company manufactures artificial gas governors and natural gas regulators for all kinds of pressure reduction, and will continue business under the management of J. C. Groble, vice-president and assistant manager.

TWENTY YEARS AGO

General Manager Nevins has about convinced the proprietors of the Haverhill (Mass.) Gas Company that it would be a good thing for them to extend the company's distribution system to and through the adjoining district of Rockland. Mr. Nevins is evidently a firm believer in the value of the nimble sixpence.

The management of the Augusta (Ga.) Gas Light Company is complimenting itself on the great results that have attended the reorganization of its new business department, which reorganization and carrying out have been under the direct supervision of Mr. R. M. Worden.

The new issue of shares of the Consumers Gas Company of Toronto, Canada, was sold at auction about a fortnight ago. The output amounted to 9,000 shares of the par value of $10. The bidding was spirited and the surprising average of 18½ was realized—on the par of $100, of course, the rate was 180½. Very few concerns in Canada could realize such prices for auctioned shares in these days of tight money markets. The largest buyers were those connected with the company, the list including the Messrs. Blaikie and Messrs. Pearson (senior and junior), Gooderham and Johnston.

The annual report of the Worcester (Mass.) Gas Light Company shows clearly what a prosperous year was the company's. Despite the reduction in selling rates the company's income showed a gain of $36,511.10. In the receipts residuals figure at the good round sum of $34,154.

The Chicago American has been "assisting" to the howling degree in the movement for "reproving" gas meters in that city. The process is actually underway, and there are the results of one day's testing—it is the only example that we have of any one day's work in this regard. Total meters tested, 16; correct (that is, within 2 per cent either way), 12; fast, 1 six per cent, 1 four per cent, 1 five per cent; slow, 1 twenty-three per cent. The slow meter was shown to be passing more gas per month than any two of the other three fast ones.

FORTY YEARS AGO

Although the gas department of the Holyoke Water Power Company's business nominally figures as of secondary importance in its transactions, we nevertheless incline to the belief that, practically, Brother Snow's annual contribution to the company's account in bank makes an imposing addition to the funds available for distribution in the shape of dividends among the fortunate holders of stock in that well-managed corporation. This year the directors determined to grant the gas consumers a share in their prosperity—a plan adopted some years ago—for we note that Brother Snow is in the field announcing a reduction in rates, to take effect on and after Feb. 1, 1888. From that date ordinary consumers are to pay $1.75 net per thousand, while wholesale users will obtain their supply at $1.50. Very acceptable tidings for the holiday season, surely.

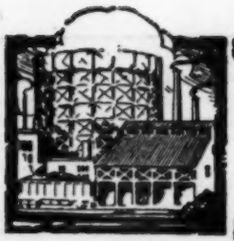
The Woodbridge (N. J.) Sun says that the Perth Amboy Gas Light Company is sending out an excellent quality of gas. Does that editor not place himself under suspicion as being a holder of Perth Amboy gas stock? Reflection, however, thrusts upon us the cold fact that editors, as a rule, are reasonably well off in this world's goods when they can proudly and truthfully boast of the possession of a well-made and staunch pair of suspenders.

Some time ago two clever sneak thieves stole about $500 from the office of the Roxbury (Mass.) Gas Light Company, the robbery being effected in business hours and with the greatest coolness possible. Two of the "operators," much to the surprise of those who suffered, have been enmeshed by the police. They—the "operators"—are stars in the "crooked" firmament and answer respectively to the names of George Carson and Rufe Miner. They were arrested in Chicago, Ill., on the 15th ult. Chief Inspector Hanscom of Boston must be a pretty clever detective, for it was chiefly through his sagacity that the purloiners were "pinched," to use the Vidocq vernacular.

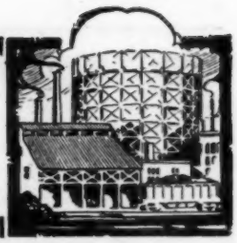
SIXTY YEARS AGO

Francis Carroll of New Orleans says at the gas works in that city there is a boiler which has been in use fourteen years and has never collected a particle of scale. The feed water is drawn from one of the gasometer tanks which are supplied from the Mississippi.

The great Parisian Company for lighting by gas effects every day more and more progess. Thus, in 1864, the consumption of the gas produced by the company was 109,708,000 cubic metres of gas (a metre is 40-inch English). This total was an augmentation of 8,776,000 cubic meters (or 8.70 per cent) over the consumption of the preceding year. Every day a fresh advance is effected in the manufacture of gas and the production becomes more and more abundant and more economical.



NEWS OF THE GAS INDUSTRY



Michigan Gas Association Launches Important Research Program

Impressed with the necessity of expanding and accelerating the amount of research work now being done in the gas industry, the Michigan Gas Association has launched a program at the University of Michigan that is the most ambitious yet undertaken in the history of any similar group.

The gas companies of Michigan, through the fellowship committee of the State Association, has just employed a director of research. He will be located at Ann Arbor. While the work will be financed and managed by the Michigan Association, the studies which are to be undertaken will be typical of the entire industry and the results will be made available to gas men everywhere.

This will be the second important gas research program to be inaugurated at the University of Michigan in one year. Early in 1927 the American Gas Association appropriated $10,000 a year for five years toward a study of gas for heat treating of metals. This work is now going forward under the direction of the Department of Engineering Research.

Pioneer in Research

The Michigan Gas Association was probably the first in the United States to undertake and encourage systematic research. Since 1900 it has maintained a fellowship which called for expenditures of approximately $1,000 a year, for making studies in various processes used in gas plants. During this time a large number of important problems were investigated.

Soon after the annual convention last July, it was decided that the expansion of research was one of the most important activities the association could undertake. It was agreed that an aggressive program headed by a competent, all-time engineer would speed the solution of many troublesome problems in gas making. The estimated cost of launching the work was underwritten by a number of member companies, the Consumers Power Company, the American Light and Traction Company, the Detroit Edison Company and the Semet-Solvay Engineering Corporation.

The work will be conducted by Elmore S. Pettyjohn, who presents excellent qualifications for serving the gas industry. He was graduated from the University of Michigan in 1918, and enlisted in the Navy, where he served fourteen months. Following his discharge, he worked for the Semet-Solvay Company and for the Ford Motor Company. Later he returned to the University and entered the engineering college, from which he was graduated in February, 1922, and the following June received his master's degree. He was employed by the Illinois Steel Company and afterward by the Chicago By-Products Coke Company. He left the latter organization to accept his present position at Michigan.

Research Plans

Mr. Pettyjohn will have available the laboratory and personnel resources of the department of chemical engineering at the University for his studies. The assistance and counsel of Professor Alfred H. White, head of the department, will be at his disposal. In addition, Mr. Pettyjohn will be able to follow up his laboratory work with actual operating tests on any of the gas plants in Michigan. It is the intention of the research committee to direct its investigations into present-day problems, which would make necessary the use of plant and service equipment to test the value of laboratory studies under the limitations of operating conditions.

The matter of the research fund and the appointment of Mr. Pettyjohn as investigator will come formally before the regents for acceptance and approval at their December meeting.

The fellowship committee of the Michigan Gas Association is as follows:

Chairman, James A. Brown, Jackson; Chairman, John W. Batten, Detroit; Dan W. Hayes, Port Huron; Charles R. Henderson, Ann Arbor; Fred W. Seymour, Battle Creek, and Frank W. Steere, of New York.

Metropolitan Industrial Gas Sales Council Formed

Last May a number of the leaders of the industrial divisions of the gas companies in the Metropolitan district proposed the formation of a local discussion group to be known as the Metropolitan Industrial Gas Sales Council. This association is to fill the long felt want of an informal exchange of ideas between the various Metropolitan gas companies. The purpose of the council is to interchange sales and service ideas and experiences. The work of this group is planned in such a manner as to permit free and wide discussion of the following:

1. The actual work of the industrial salesman or industrial engineer in meeting and solving his problems.

2. Successful conversions of industrial processes to gas fuel.

3. Results of newspaper advertising and lectures.

4. Installations and their problems.

5. Maintenance of existing gas appliances in use on the consumers' premises.

To date five very interesting meetings have been held under the direction of the chairman, Mr. A. J. Peters, assistant general sales manager of the Consolidated Gas Company. The topics thus far discussed were: Gas vs. oil for house heating, problems in gas house heating, varnish cooking installations and a discussion of the papers delivered at the 1927 convention of the American Gas Association.

At the next meeting of the council, December 14, 1927, Mr. J. P. Leinroth of the Public Service Gas Company of New Jersey will lead a discussion on "Industrial Sales Methods." At the January 11th meeting of the council Mr. N. C. Heyman, service engineer of Consolidated Gas Company, will present a discussion on "Meat Smoking by High Pressure Gas."

The companies represented in the Metropolitan Gas Sales Council are Brooklyn Borough Gas Company, Brooklyn Union Gas Company, Consolidated Gas Company, Kings County Lighting Company, New York and Richmond Gas Company, Public Service Gas Company of New Jersey, and Westchester Lighting Company.

No three numbers
ever sweetened a line so much

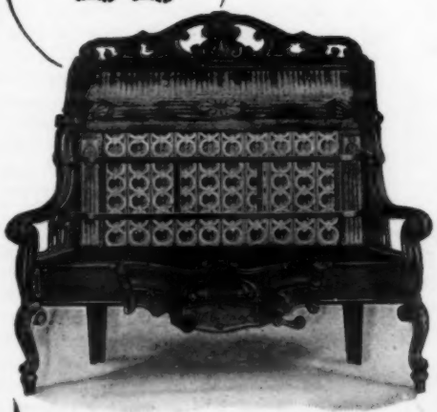
THESE three Welsbach models are giving the radiant heater business the biggest revival it has ever had. One salesman was so enthused that he decided to show them at a county fair. He sold ten before he had time to take his hat off . . . A manager of a gas company branch has asked for a truck to do a door-to-door job. He says they sell on sight . . . Gas Companies everywhere are getting the old campaign tactics out of camphor. Here's a line that is worth pushing with all the old-time vigor . . . Welsbach Radiant Heaters are flexible and efficient. They have unusual beauty of design and finish. And the prices win customers quickly.

Approved by the
A. G. A. TESTING LABORATORY
Approved by
GOOD HOUSEKEEPING INSTITUTE

Welsbach
Radiant Heaters

WELSBACH COMPANY, GLOUCESTER CITY, N. J.
OFFICES IN PRINCIPAL CITIES
Members of American Gas Association

$22

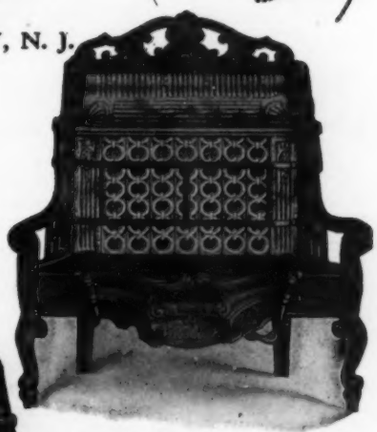


No. 47—Ten glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 24 inches wide, 11½ inches deep.

$28

No. 49—Twelve glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 28 inches wide, 11½ inches deep.

$15



No. 51—Seven glowers. Finish: Silvered Brown. Columns beautifully tinted. Size: 23 inches high, 20¼ inches wide, 11½ inches deep.

Brooklyn Union Executives Inspect Appliances at Polytechnic Institute

The executives and heads of departments of the Brooklyn Union Gas Company visited the Polytechnic Institute on November 1 to view the gas burning appliances presented to the Institute by the company. These appliances equipped a part of the mechanical engineering laboratory.

The Polytechnic Institute is presenting to an evening class a course on the "Elements of Gas Engineering," which consists of 20 lectures and 20 laboratory sessions dealing with the principles underlying the manufacture, distribution and utilization of manufactured gas with their applications.

The elements of the physical law of gases and of the chemical processes of combustion and gas making will be simplified by experimental work during the laboratory sessions.

Combustion processes, heat and temperature measurements all tend to give a better understanding of efficient combustion in gas fired apparatus.

The apparatus of the physics, heat treatment, foundry, forge, chemical engineering laboratories of the Institute will be available for this work. There is a total enrollment of 46 pupils in this class, 24 of whom are from the Brooklyn Union Gas Company, nine from the Kings County Lighting Company, nine from the Consolidated Gas Company, and four from the Brooklyn Borough Gas Company.

The delegation was received by S. Parke Kolbe, president of the Institute, and members of the faculty. After the inspection of the laboratory a picture was taken of the delegation and the personnel of the Institute.

Georgia Power Company Stages Essay Contest

One of the first "companion contests" in the big essay contest of the Southern Gas Association on the subject "If It Is Done With Heat You Can Do It Better With Gas" will be held by the women's committee of the Georgia Power Company from September 15 to January 15, 1928.

All women employees of the company are eligible to enter the contest, and the essays, which must not be more than 1,800 words in length, will be judged on the following basis:

1. Correctness of the points discussed, 75 per cent.
2. Clearness of expression, 10 per cent.
3. Forcefulness in discussion of subject, 10 per cent.
4. Originality, 5 per cent.

A committee will be appointed to judge the local papers, and the three winners will be entered in the contest of the Southern Gas Association, which closes on February 1.

A first prize of $25 has been offered by the Georgia Power Company in this contest, with a second prize of $15 and a third price of $10. Prizes offered by the Southern Gas Association are $100, $25 and $15 for first, second and third prizes respectively.

Control of Natural Gas Properties Acquired

Control of natural gas distributing properties in Cambridge City, Newcastle and Rushville, Ind., which will serve six other communities and are to be extended to two more, has been acquired by A. B. Ayres, gas and oil developer of Newcastle. With the approval of the Indiana public service commission, the properties will be consolidated and improved as the $500,000 holdings of Eastern Indiana Gas Company.

Preliminary steps toward the consolidation of Eastern Indiana gas utility properties have been consummated and announced by Mr. Ayres through his agent, Wilbur Jessup, and a petition for approval of the plan will be filed with the public service commission shortly.

The Eastern Indiana Gas Company was incorporated with a capital stock represented by 10,000 shares of no par value stock.

Three principal properties involved in the consolidation are the Cambridge City Gas Company, the Citizens Gas Company of Newcastle and the Rushville Gas Company. The Cambridge City Company has distribution of natural gas in that city, East Germantown, Milton, Dublin, Straughan, Raleigh and Mays.

The Citizens Gas Company of Newcastle is a non-operating distributing company formerly owned by the Albert Ogborn estate, which owns seven miles of pipe lines in Newcastle.

All except a one-fifth interest held by the James P. Goodrich interests has been acquired by Mr. Ayres in the Rushville Gas Company.

Altogether the Ayres acquired properties are serving at the present time more than 80,000 consumers.

Proposed development of the properties anticipates the construction at Cambridge City of an artificial gas manufacturing and mixing plant, which will cost about $200,000. The Newcastle, Cambridge City and Rushville systems then will be connected with this major plant. Replenishment of the natural gas supply of the territory will be the first attempt of the corporation.

Richmond Installs New Equipment For Handling Coal

The city of Richmond, Virginia, has recently completed the installation of new equipment for handling gas and steam coal at their plant. James M. Purcell, assistant superintendent of the gas plant, had active charge of this project and took the initiative in planning and handling it. Because of the great amount of breakage of gas coal he felt that it was absolutely necessary to install some type of equipment which would handle the coal more carefully and not cause it to be broken up and degraded to the extent of a large annual loss.

After a thorough study and investigation he selected the Mono-Rail type of equipment made by the Galion Iron Works and Manufacturing Company, Galion, Ohio, under the name of "Mono-Veyor." This equipment has now been installed and is in operation and, it is estimated, will pay for itself within two or three years by the prevention of coal breakage.

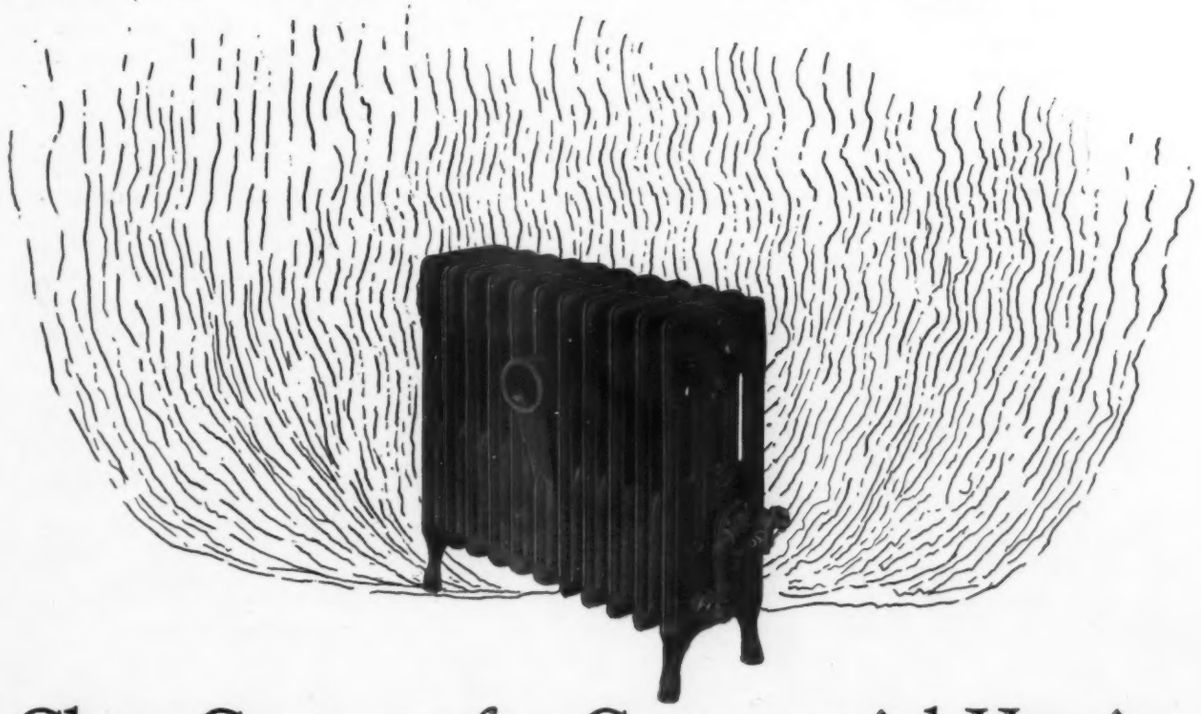
Government Pamphlets

Prices indicated are charged by the Superintendent of Documents, Washington, D. C., for pamphlets. Send cash or money order; stamps and personal checks not accepted. When no price is indicated pamphlet is free and should be ordered from Bureau responsible for issue.

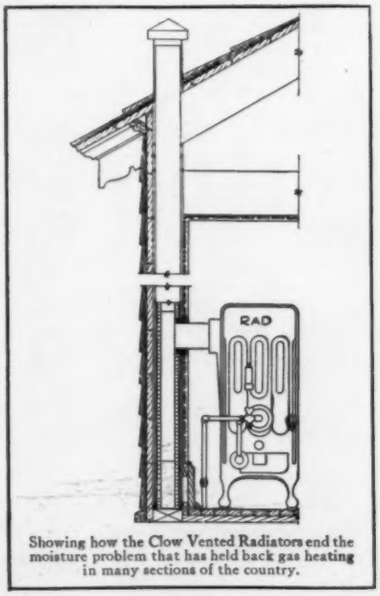
Petroleum Refining. Census of Manufactures pamphlet giving 1925 production figures. 5 cents.

Fuel Briquets in 1926, by F. G. Tryon. Bureau of Mines Mineral Resources pamphlet. 5 cents.

STEAM FOR HEAT — GAS FOR FUEL



Clow Gasteam for Commercial Heating —Because Clow Radiators *S-p-r-e-a-d* the Heat



Showing how the Clow Vented Radiators end the moisture problem that has held back gas heating in many sections of the country.

Clow Gasteam Radiators surge the heat *out*, never forgetting that floors and corners must be heated too.

Gasteam Radiators are used for all kinds of commercial heating.

Office managers and storekeepers can be shown plainly the advantages of heating with *real* steam heat.

Clow Gasteam Radiators end the moisture problems that has held back gas heating in many sections of the country.

Send for our new catalog illustrating the application of Clow Gasteam Radiators for all types of buildings and in all sections of the country.

JAMES B. CLOW & SONS
201-299 North Talman Avenue, Chicago

CLOW A. G. A. and Underwriters' Laboratories Approved. GASTEAM

STOCKED IN EVERY SECTION OF THE COUNTRY

Construction Does Not Deter Advertising

The accompanying picture shows the lower part of the Public Service Building in course of erection in Portland, Oregon. The center part of the building is fourteen stories high while the wings are three stories inside and two outside. The first story is twenty-five feet high with a ten-foot mezzanine floor for the sales office department along the sides. The building will be occupied the middle of December.

The left wing will be the store of the Northwestern Electric Company and the right wing of the Portland Gas and Coke Company.

While the sidewalk and part of the street were occupied by the contractor, the fence erected along the same was utilized for advertising cooking and heating with gas. As the picture shows, it was an unusual opportunity for striking advertising.

Agree to Pay for Delay in Completing Pipe Line

The Houston Gulf Gas Company has agreed to pay the Houston Gas & Fuel Company $161,000 as a forfeit for delay in completing the pipe line from which the Texas city receives its supply of natural gas, according to an announcement by Mayor Oscar F. Holcombe. The Houston Gas & Fuel Company is one of the distributors of natural gas in Houston.

Natural gas was brought to Houston May 14, 1926, seventy-one days late, according to the franchise which the City of Houston gave, which called for a penalty of $2,000 a day to be paid the Houston Gas & Fuel Company for every day's delay after March 1, 1926.

When the gas arrived the penalty totaled $150,000. The sum has been withheld at 6 per cent interest until a recent meeting of the Houston Gulf Gas Company, at which it was decided to make the payment, it is explained.

Holyoke Gas Department Purchases Large Mill for Expansion

The City of Holyoke has voted a bond issue of $575,000 to purchase the property of the American Thread Co. This amount will be paid in yearly instalments from the gas company's own receipts without affecting the tax rate of Holyoke.

Manager Kirkpatrick told the Board of Aldermen that the proposition to buy the property was not a new one, in so far as it related to plans for the forced expansion of the company. The pressing need for additional holder capacity necessitates the purchase of more land. The site purchased is sufficient to provide for the needs of the gas company for many years.

New Company Chartered to Develop Natural Gas Fields

Belmont Quadrangle Drilling Corporation, Olean, Cattaraugus County, has been chartered at Albany with $100,000 capital to develop oil lands, petroleum, rock or carbon oil and natural gas. George H. Bradley, Bolivar; Edward H. Wright, 139 Fulton street, Olean; Paul D. Terry, Bolivar; Forest D. Dorn, R. J. Brennan, 78 Main street, Bradford, Pa., are the incorporators.

Application for Stock Acquisition

The New York State Gas & Electric Corporation has made application to the Public Service Commission for authority to acquire all of the outstanding stock of the Plattsburgh, N. Y., Gas & Electric Company and the Harlem Valley Electric Corporation now supplying gas and electricity to various eastern and northeastern municipalities and to merge the properties into the New York State Gas & Electric Corporation.

The petition states that associated interests now own all the outstanding stocks of the three companies and that acquisition by the New York State company is a definite step toward securing advantages of operation and financing incident to and resulting from grouping of these properties which their geographic location indicates are possible for accomplishment.

Insull Interests Buy Control of Big Utility

The Samuel Insull interests have purchased a controlling interest in the Western United Gas and Electric Co., a $32,000,000 public utility in the Fox River Valley centering in Aurora and Elgin.

Although details of the transaction have not been revealed, it is learned that former Representative Ira J. Copley, long the directing head of the units, will retain several million dollars' worth of his holdings.

Acquisition of these properties by the Insull interests adds another unit to utility holdings already representing an estimated total capitalization of more than $750,000,000. The Insull utilities extend in a fan-shape from Chicago.

Great Lakes Utility Company Accepts Franchise for Providing Gas Service

The Great Lakes Utility Company, which controls the Paxton Gas Company, has accepted the franchise proposed by the village of Rantoul, Ill., for installation of gas mains within the Rantoul limits and for providing gas service for the town. The franchise is practically the same as that in Gibson City, Ill., where the Great Lakes will also provide gas service. The franchise provides for gas tanks which it is expected will be erected in the east part of the town.

"God Bless Us Every One"

LISPED Tiny Tim—and what better greeting for you and for us at this happy Christmas time?

How the time gets away. Only yesterday it was last Christmas. We are getting old! Since we wrote our first Christmas advertisement years ago, we have come through three "panics" and two wars and have become grizzled and bald. How is it with you, old man?

Yes, the time flies. That youngster skylarking around here the other day as the "last cub" is now a serious journeyman with wife and babies. That good jour. has become the foreman. The foreman stands in the superintendent's shoes, and the hustling superintendent has become the "Old Man." The downy-lipped junior has moved his traps to the desk in the inner office, and the Grand Old Seniors, gentle voiced and gentle mannered—who founded the business and built it up for you—lay down their splendid work and go to their long home. Let us remember and appreciate them just a little bit at Christmas.

With men, so with machines. The passing years establish the appliance of merit. The good thing of this year becomes the Old Reliable of next year. No, sir, not a word about Elevators. Why, Boy, it's Christmas!

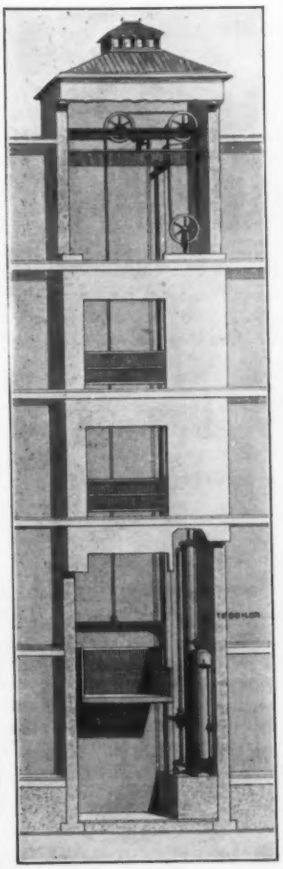
But say, Brother, you and I, who have talked together every Saturday for a whole year—yea. for many whole years—are we not greatly blessed that this joyous Christmas time finds us here happy and prosperous? If our Elevators have made you happy, your many orders have made us prosperous. We have spoken our Little Piece week after week, dear knows, poor enough sometimes, but always the best we could, and you have so patiently listened to us, believed we told the truth, and sent us your orders, and said nice things about us, and—

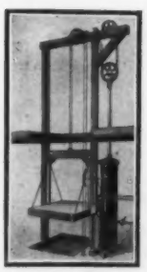
Oh, well, we were just thinking how nice it is we have been able to be thus mutually helpful and useful to each other. This is the true secret of a Successful Life, after all, isn't it? This is what the CHRISTMAS MAN came to do.

And we wonder if it is not a good idea to stop once a year and lovingly think of these things.

"PLEASE TAKE THE ELEVATOR"

May your heart and your life go like the Elevator—UP.





CRAIG RIDGWAY & SON COMPANY

COATESVILLE, PA.

Coal Stocks Continue High

Industry generally, and public utility companies in particular, have expressed gratification at the results of the Government survey on existing commercial stocks of coal in the hands of consumers October 1. This joint report from the Bureau of Mines and the Bureau of the Census indicates 61,900,000 net tons of bituminous coal on hands in consumers' stocks, which is an almost negligible decrease in stock since July 1. Gas men are, therefore, expressing confidence that no interruption in fuel supply need be anticipated during the coming winter season. The official report includes the following significant paragraphs regarding by-product coke and public utility plants.

"There was an increase of more than 100,000 tons in the quantity of coking coal in storage at by-product plants on October 1, when compared with the amount held by the same companies on July 1. Of 6,834,661 tons in stock piles on the first of October, 1,674,225 tons were low volatile and 5,160,436 tons high volatile coal. The steel plants reported a total stock of 2,714,488 in storage on October 1. Of this amount 1,196,577 tons was gas coal and 1 517,911 tons steam coal."

"By-product coke plants:

	Day's Supply	
	Aug. 1	Oct. 1
Low volatile	39	44
High volatile	39	39
Average	39	40"

"Large reserves are still in the hands of the public utilities. There was a slight decrease in the amount of coal held by coal gas plants, while stocks at electric utilities increased 2.9 per cent. At the rate of consumption prevailing in August and September the stock at gas plants on October 1 were sufficient to last 93 days and the electric utilities had 69 days' supply on hand."

Rockford Company Sold by U. G. I. Co.

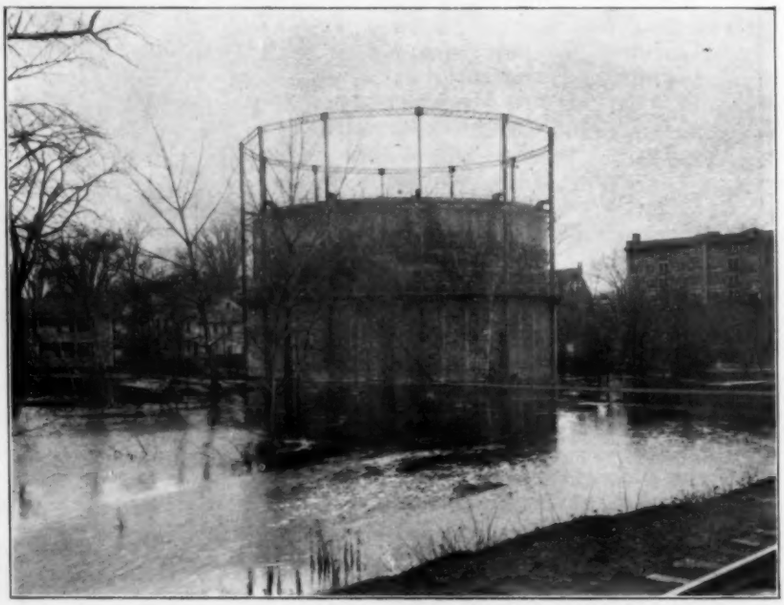
The United Gas Improvement Company has sold the Rockford (Ill.) Gas Light and Coke Company to the Central Public Service Corporation of Chicago. It was announced at U. G. I. offices that the sale of this property is in line with U. G. I. policy to dispose of isolated properties and to so group its holdings to permit their most economical operation.

The Rockford Gas Light and Coke Company supplies gas to a population of approximately 95,000 in Rockford and suburbs.

Northampton Gas Light Co. Maintains Service During Flood November 5th

"The city was very fortunate in retaining its gas supply Saturday night. The plant was kept in full service by only the narrowest margin. A gang of men worked for twelve hours battling the water from the Mill River, which backed up into the company's plant."—From Daily Hampshire Gazette.)

Philip Facey, an employee at the plant, did an unusual piece of work toward preventing the gas supply from being shut off. It was necessary to put an extension on a pipe leading from a pump which pumps the drip to the inlet of the storage holder. This pump, owing to the unprecedented height of the water, was eight feet under the water and it was necessary for a man to go under water to connect an extension. This work was such an effort that Facey was badly exhausted after coming out of the water. The gas supply was down to 80,000 cu. ft. when Facey was successful in making the connection.



Meeting of Sales Club of Central Indiana Gas Company

A banquet meeting of the Sales Club of the Central Indiana Gas Company of Muncie, Ind., was held recently in that city. A report of the meeting of the American Gas Association in Chicago was given by R. G. Tracy, divisional manager of Muncie, H. W. Thornburg of Anderson, and A. T. Bartow of Marion.

Signs Big Gas Contract

The Colorado-Wyoming Gas Company, a subsidiary of the Public Service Company of Colorado, signed a contract with the Ideal Portland Cement Company to deliver natural gas to its new plant near Fort Collins, Colorado. While the price of gas was not given out, the company states there will be used something like five or six million cubic feet daily.

Town Must Obtain More Customers in Order to Get Gas

The town of Roanoke, Ind., has been informed by representatives of the Northern Indiana Public Service Corporation that 33 additional contracts for gas must be obtained or the company will not tap the big main which it is building to the city limits of Huntington, Ind. The company wants a minimum of 100 customers in Roanoke, through which the big main passes, before installing any laterals.

Monster Gas Well

The Gulf Refining Company drilling in section 29-17-6, Louisiana, the Monroe gas field, recently brought in a gasser making 64,983,310 cubic feet daily, and this is said to be the largest gasser ever brought in anywhere in Louisiana. It is the Mansfield No. 2.

Below: The world's finest and most up-to-date gas water heater plant.

In panel: Part of the experimental laboratory of the Hoffman Heater Company.

We Experiment Here!

Not in your customers' homes

One of the earliest policies of the Hoffman Heater Company was that none of its heaters should be offered to the public until exhaustive experiments *in the factory* had proved their efficiency beyond question.

So faithfully has this policy been lived up to that not once in the 25 years of the company's existence has it been necessary to withdraw a model because of unsuspected defects.

These rigid factory tests, plus a quarter of a century's experience in the making of gas water heaters, enable the Hoffman Heater Company to know in advance that its heaters will give satisfaction. Thus its improved models, including the revolutionary Master Storage System, are presented with absolute confidence in their ability to make good in the homes of your customers.

It means much to you to know that the heaters you install are not still in the experimental stage. There's no profit in selling heaters which need frequent adjustments and repairs.

No. 3, one of the seven sizes of Hoffman Instantaneous (direct type) Automatic Gas Water Heaters.

WHERE SERVICE IS HARDEST
you'll usually find Hoffman Heaters

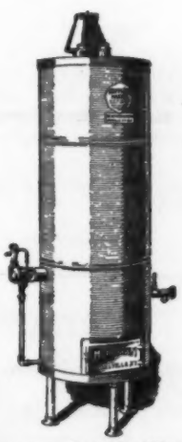
It's a significant fact that wherever gas is poor in quality or low in pressure Hoffman Heaters are almost always installed. The same is true where water is extra hard or its pressure is unusually low.

HOFFMAN

AUTOMATIC
GAS WATER HEATERS

THE HOFFMAN HEATER CO., Inc.
1701-15 Eighteenth Street, Louisville, Ky.

Hoffman is the ONLY concern manufacturing an absolutely complete line of water heaters, including instantaneous heaters in all sizes, domestic storage systems, multicoil storage systems, unit storage systems, tank heaters and house heaters.



The new Hoffman Master Automatic Storage System (patents applied for), which is available in two sizes.

Purdue Holds Successful Gas Metermen's Conference

The third Gas Metermen's Conference, held at Purdue University at Lafayette, Ind., November 8, 9 and 10, attracted an enrollment of 75, larger than ever before, and was featured by practical bench and repair work for gas metermen, and an outstanding address by R. B. Harper, Chief Chemist, Peoples Gas Light and Coke Co., Chicago, on "Problems of the Gas Industry." Due to the interest shown by gas officials in the conference, next year's program will be considerably augmented and features will be selected which will be of interest to gas managers, superintendents and engineers.

Mr. Harper's talk laid before the conference visitors some fifty problems with which the industry is faced and which must be solved. Chief among the investigations which are now under way are those dealing with raw materials, the handling of gas in the manufacturing plant, distribution to the consumer, and the development of new and cheaper appliances for the consumer.

Improvements are in order, Mr. Harper pointed out, from the use of new and better and more economical raw materials to the point where the gas is delivered to the consumer's home or manufacturing plant. Cheaper appliances must be invented. Research work in progress at the present time is seeking to find the possibilities of the use of Indiana coal in gas manufacture.

The lectures and demonstrations covered every phase of the repair and maintenance of iron and tin covered gas meters.

Among those who appeared on the three-day program were Dr. H. C. Peffer and W. A. Knapp, of Purdue; George A. Lane, William Rosenia and R. B. Harper of the Peoples Gas Light & Coke Co., Chicago; Frank Sanger and C. B. Dushane, Jr., of the American Meter Co., Chicago; Prof. J. L. Bray of Purdue; E. C. Falvey, Sprague Meter Co., Davenport, Ia., and L. C. Heavner, Superintendent of Production, Northern Indiana Public Service Co., Fort Wayne.

Personals

Hunt Appointed Associate Counsel

Lowell D. Hunt has been appointed associate counsel by George H. Shaw, in charge of legal affairs of the Public Service Company of Colorado.

Murdock Made District Manager

W. J. Murdock, superintendent of the Coal Products Company, a branch of the Western United Gas and Electric Company, Joliet, Ill., has been made district manager in charge of all the company's Joliet properties, succeeding C. I. Carlson, who has been manager the last ten years, and is now general manager of the Aurora, Ill., office in charge of the district, including the Aurora, North Aurora, Naperville, Oswego, Yorkville, Sandwich and Plano plants.

Clare N. Stannard Heads Electric Light Group

Clare N. Stannard, vice-president and general manager of the Public Service Company of Colorado, was elected president of the Rocky Mountain unit of the National Electric Light Association at its annual convention held in Colorado Springs October 17-20. Other officers elected were: W. D. Johnson, Mountain States Power Company, Casper, Wyo., first vice-president; J. A. Clay, Western Colorado Power Company, Durango, Colorado, second vice-president; J. E. Loiseau, secretary of the Public Service Company of Colorado, Denver, third vice-president, and A. C. Cornell, Graybar Electric Company, Denver, secretary-treasurer.

Davis Joins Chas. S. Wood & Co., Inc.

Edward F. Davis, for a number of years with the Brooklyn Union Gas Company, as industrial engineer, and the Celite Products Company, as insulating engineer, has now joined the forces of Chas. S. Wood & Co., Inc., Newark, N. J., and New York City.

Mr. Davis, in joining this company, has widened his field of activities in the insulating field. He will handle a complete line of Diatomaceous Earth (natural and calcined), as heretofore, and as Chas. S. Wood & Co., Inc., maintains a thoroughly equipped contract department, and are distributors of Ignisite, High Temperature Cement, Banner Rock Products, Asbestos and Magnesia Products, will cover the entire field of industrial manufacturing.

W. K. Eavenson to Represent Glenwood Range Company

W. K. Eavenson has become affiliated with the Glenwood Range Company, in Taunton, Mass., and will represent them in the Pennsylvania territory.

He has had a wide experience both in the domestic and industrial divisions of the gas business, having been connected with the United Gas Improvement Company for eleven years, with the New York Consolidated Gas Company for eight years, and for the past eight years with the Fall River Gas Works Company, Fall River, Mass., in the capacity of sales manager. This varied training will be useful to him in his new work.

Obituary

Veteran Gas Engineer Dies

Frank D. Moses, one of the pioneers in construction of gas works equipment in the United States, died November 7 at his home in Trenton, N. J. Mr. Moses was the founder and president of the Gas Engineering Company of that city, a concern which has been well known in the industry since its organization in 1903.

As one of the old guard of the industry, Mr. Moses had a wide acquaintance. He was born in Great Falls, N. H., in 1858, and at 16 years of age had his first opportunity in the gas industry as a lamp lighter of the Sterling, Ill., gas company. Later he was connected with the gas works at Indianapolis for four years, after which he became one of the construction engineers of the Kerr-Murray Company. Later he was with the Mutual Fuel Gas Company, of Chicago, working at several of its subsidiaries until 1898, when he went to Trenton to build the new gas plant of that city. After five years with the company he established his own gas engineering business and continued active in that work until his death.

Washington Gas Official Dies

William B. Orme, who recently retired after 60 years of continuous service wtih the Washington Gas Light Company, died on November 9 at his residence in Washington, D. C. At the time of his retiring from active work Mr. Orme was secretary of the company. He was a native of Baltimore, but had lived in the District of Columbia since the age of two years. He was 85 years old at the time of his death.

Correction

On page 53b, November issue, top of page, there appears the following statement: "the cost is less than 3.4 cents per $1 of revenue."

This should read: "the cost is less than ¾ cent per $1 of revenue."

Savings *by* Smith

The Smith patented method of electric welding of the longitudinal seam makes possible the production of pipe from 16 to 22 inches in diameter and 30 feet in length of *uniform* length, diameters, and wall thicknesses.

Fewer Joints

Smithsteel Pipe is made plain end and plain end beveled for any field joint. The 30-foot lengths of Smithsteel Pipe will require only 175 joints to the mile as compared with 263 needed for the usual 20-foot lengths of pipe.

Joining Simpler

Smithsteel Pipe is accurate in both outside and inside diameters. The wall thicknesses are uniform. The joints will butt up evenly at all points making alignment and either welding or coupling simpler and surer. Joining will therefore be quicker and easier.

The Use of Less Metal

Due to the Smith method of fabricating and the high quality steel, less metal can be used in the body of the pipe.

You Can Specify Any Thinness

You can specify any thinness you require and each and every foot in every Smithsteel Gas Line Pipe will be the same thinness. The metal will be exactly the thinness you specify and free from scale.

Now—it is not necessary to put more metal in the ground than you need. Smith will make, for you, the pipe for natural gas lines that suits all conditions encountered and you can depend upon it having a long life.

A. O. SMITH CORPORATION

Oil & Gas Field Products Division

General Offices—Milwaukee, Wis.

District Offices at Pittsburgh, Tulsa, Dallas, Los Angeles

SMITHSTEEL GAS LINE PIPE

Trade News and Construction

U. G. I .Contracting Company's Activities

In addition to its previous contract with the Minneapolis Gas Light Co. for the installation of two 11 ft. U. G. I. sets, etc., the U. G. I. Contracting Co. has been further commissioned to install ash car trackage, necessary drains and drain piping for the new generator house, building changes and additions and the excavation and concreting of the retort house basement.

Under the management of the General Engineering and Management Corporation, the Dover, N. J., plant of the Jersey Central Power & Light Company is being improved by the installation of new and additional equipment. Part of the new equipment will be a 6 ft. U. G. I. cone top carburetted water gas apparatus complete with Chrisman Cycle and connections for exhaust steam operation, for which orders have been received.

The Atmospheric Nitrogen Corporation, Syracuse, N. Y., has placed orders for equipment for its blue gas apparatus. The improvement also includes a Smoot Fluid Control for the apparatus.

The Pier Process is being installed at the Long Branch, N. J., plant of the Jersey Central Power & Light Co. This process makes possible the successful and efficient operation of the plant with the use of soft coal in carburetted water gas apparatus.

Heat Regulator Companies Consolidate

The consolidation of the Minneapolis Heat Regulator Company with the Honeywell Heating Specialties Company to form the Minneapolis-Honeywell Regulator Company marks one of the most important developments in this industry since the original invention of thermostatic control.

This consolidation brings together the two most important units in heat regulating business, the growth of which closely parallels the success of the Minneapolis Heat Regulator Company.

Both the Minneapolis Company and the Honeywell Company have recognized the importance of advertising. The Minneapolis Company, in view of its extensive sales at retail to the customer, has made its principal appeal directly to the public, using the most popular magazines and newspapers as its media. In view of the fact that the Honeywell Company drew the greater part of its business directly from the manufacturer, it has advertised principally in trade journals, although it has also used the popular magazines and newspapers.

Through persistent advertising of both companies the names "Minneapolis" and "Honeywell" have become nationally known and their respective products have become standard.

Mr. W. R. Sweatt, president of the Minneapolis Heat Regulator Company, will be chairman of the board of the new consolidation.

Gas Machinery Company Twenty-five Years Old

The Gas Machinery Company of Cleveland, Ohio, has now been in existence and operating for 25 years.

It was incorporated November 28, 1902, and has been actively engaged in the manufacture of gas machinery since that time.

Complete coal gas plants, water gas plants, oil gas plants, and producer gas plants as well as all the various parts thereof have been furnished and erected by the Gas Machinery Company in every State of the Union, and also outside of the United States, and all of the original officers and executives of the Gas Machinery Company are still active in that corporation.

Record Range Sales

With the sale of 909 Clark Jewell gas ranges in the brief time of six days the Atlanta Division of the Georgia Power Company is believed to have set up a record in the sale of gas ranges which has never been equalled by any gas or power company in the United States.

The sale opened on November 7 and lasted through November 11, and a quota of 300 gas ranges was set for the city. The ranges were reduced from $57 to $37 in price, customers being given the privilege of paying $1 down and the balance in a series of twelve monthly payments. The sale was extensively advertised in the local papers, blind, or "teaser" ads featuring "7 and 37," giving place to a full announcement on Sunday, November 6. And the response was instantaneous.

At the main store, where a quota of 100 ranges had been set, 445 ranges were sold during the week. At the five branch stores, where quotas of 50 ranges had been set, sales were as follows: Decatur, 143; Euclid Avenue, 140; West End, 112; Peachtree, 69. Not a single store failed to go over its quota, and the district as a whole exceeded its quota by 303 per cent.

Gas Machinery Co. to Install Benches in Cambridge, Mass.

The Cambridge Gas Light Company, Cambridge, Mass., have placed order with the Gas Machinery Company of Cleveland, Ohio, for materials for two benches of ten retorts each.

The retorts are horizontal throughs, each retort being twenty feet long.

The Cambridge Gas Light Company recently converted their benches of rights into benches of tens, thus adding twenty-five per cent to the capacity of the retort house with comparatively small investment cost.

An order has been received for new gas equipment to be installed in the plant at Newton, Iowa.

The new equipment consists of a condenser, exhauster, tar washer, and a P. & A. tar extractor.

The order also includes sixteen-inch and twelve-inch bypasses and yard piping for the new plant that the City of Newton is building, and in which the Gas Machinery Company is also furnishing water gas apparatus and other auxiliary equipment.

Semet-Solvay Engineering Corporation Installs 20 Tons of Welded Steel Pipe at Atlantic City Gas Plant—Other Contracts Received

Twenty tons of 30-inch, 24-inch and 10-inch welded steel pipe were installed in the plant of the Atlantic City Gas Company during the latter part of November.

The order was for piping to connect the relief holder, the washer cooler and the purifiers, the latter items being additional equipment very recently built by the Semet-Solvay Engineering Corporation.

For the entire line there are only 18 flanges, mostly at ends, and where the piping joins with apparatus. The remainder of the lengths are welded together. In the welding slight bends were made for a part of the line that was run around a gas holder. If this same line were built of cast iron the weight would be more than double that of steel. Bends of varying radii would be needed to take care of slight curves. Unless cast iron were laid underground very strong supports would be necessary. Moreover, the erection would require heavy machinery.

Eight hundred purifier trays ordered by the Malden and Melrose, Mass., Gas Light Company were designed to order, built and shipped in 14 working days.

The trays were a rush order, wanted for installation in a new purifier. They are of the Steere reversible type, made of soft white pine. Slabs are fastened with sherardized bolts.

STYLE B
(*Actual Size*)

Interchangeable with heat control.

FEATURES

of New Styles A and B

Shows actual Fahrenheit degrees.

Quick-acting thermostatic metal registers correct temperature immediately.

Extreme heat cannot injure or make the thermometer inaccurate.

Style B interchangeable with heat controls.

Carefully calibrated.

Porcelain enamel dials in two colors.

Accuracy guaranteed for the life of the oven.

No glass or mica to get broken.

Economical in price.

Handsome in appearance, add greatly to the looks of any oven.

Nickel or Porcelain Enamel Cover

"Very Satisfactory to the Consumer in Accuracy and Wear"

The president of the big manufacturing company in Massachusetts, making a celebrated range, who writes the words quoted above, tells how the *consumer* actually benefits by

THE COOPER OVEN THERMOMETER

"Accuracy and Wear"—These two essentials are characteristics of *all* Cooper Oven Thermometers. Accurate—because we make them carefully from an experience of over 32 years of specialization. Wear—because the actuating element is heat treated and carefully calibrated and will last the life time of the oven, with no danger of burning out.

The Cooper Oven Thermometer gives an absolutely accurate and reliable indication of the oven temperature so essential to perfect baking results—the hope of all careful housekeepers. The Cooper will surely help sell the range so equipped. Try it!

THE COOPER OVEN THERMOMETER COMPANY

4 MAIN STREET **(Established 1885)** **PEQUABUCK, CONN.**

The Semet-Solvay Engineering Corporation is installing a 41-foot washer cooler for the Wausau, Wis., Gas Company. The equipment will have a scrubbing and cooling capacity of half a million cubic feet of gas every 24 hours. Supplementing the installation will be two banks of Steere cooling coils and the required pumps and piping. The cooling shell will contain 30 feet of scrubber grids.

A Steere five-foot water gas machine is being installed for the Great Lakes Utilities Corporation, Paxton, Ill. It will be equipped with the backrun and spray fittings will be installed in the superheater, which will permit the operator to use water for making backrun steam.

In addition to the water gas machine, the plant is also being provided with a 30-foot washer cooler and a purifier, 10 ft. by 25 ft. by 10 ft., with necessary pumps and piping to fit this equipment into the present plant.

The apparatus will be mostly of welded steel construction. Purifier boxes are welded both inside and out and tested for tightness at a pressure far in excess of what is required in ordinary operation. All piping will also be of Steere welded type.

Work is going forward rapidly on the installation of a Steere water gas machine and a large volume of plant equipment for the Great Lakes Utilities Company at Bryan, Ohio. The construction program requires the complete rebuilding of the utility's water gas plant. The work includes, in addition to the machine, installation of a washer cooler, a multiple washer, a two-compartment purifier and all necessary piping. The plant is to be ready for service January 1, 1928.

The water gas machine will be the Standard Steere 5-foot set, equipped with backrun. Water sprays will be built in the superheater to permit the use of water for making backrun steam. The backrun and stack valve will be hydraulically operated. The remainder of the machine will be hand-operated.

The washer cooler will be 2 ft. 6 in. in diameter and 35 ft. high. It will contain 25 feet of Steere grids and will lower the temperature of the gas entering it from approximately 175 degrees to 100 degrees F., with cooling water at 60 degrees available. Two stacks of Steere cooling coils will complete this part of the equipment.

Howard J. M. Lloyd Affiliates With Pittsburgh Equitable Meter Co.

Mr. Howard M. J. Lloyd, formerly with the Helme and McIlhenny Division of the American Meter Company, has joined the forces of the Pittsburgh Equitable Meter Company, of Pittsbugh, Pa.

Until the death of Mr. J. D. McIlhenny, Sr., Mr. Lloyd was employed as his assistant. His many years' experience with his former affiliation has made him well versed in the distributing and measuring division of the gas industry.

Mr. Lloyd will be located in the New York office of the Pittsburgh Equitable Meter Company, and will cover the Eastern territory.

Western Gas Construction Company To Install Water Gas Sets in Winterhaven

Contract has been awarded for new water gas sets and auxiliary equipment to be installed in the new manufactured gas plant at Winterhaven, Florida.

The gas made in this new plant will supply the city of Winterhaven and also the adjoining city of Bartow.

The contract includes two water gas sets, complete with auxiliary equipment, also the equipment for cooling and scrubbing the gas, turbo blowers, tar washer, feed water heater, station meter, generator charging equipment, etc.

Mr. Ralph B. Wagner, president of the Central Florida Gas Company, has promoted and is supervising the construction of the manufacturing plant and distributing systems.

Thomas Calorimeter To Be Used At New Coke Oven Plant

The Koppers Construction Company of Pittsburgh, Pa., have ordered a Thomas Calorimeter for the new coke oven plant being erected on the site of the old Otto Ovens at "Coke Otto," near Hamilton, Ohio.

Birch To Be Manager of Detroit Office for R. H. Beaumont Co.

R. H. Beaumont Co., Philadelphia, announces that George T. Birch, recently connected with the home office, has been transferred to their Detroit office, 901 Kresge Building, and will act as district manager of that territory.

Combustion Engineering Has New Vice-President

Mr. Edwin H. Lundgren, for the past four years general sales manager of the Combustion Engineering Corporation, has recently been elected vice-president and general sales manager. His association with the Combustion Engineering Corporation began in 1921, at which time he resigned as vice-president and chief engineer of the Frederick Engineering Company, Frederick, Md., to come to New York. Mr. Lundgren is a graduate of the Swedish Government Technical College with a degree of Mechanical Engineer. He is an authority on the design and construction of stokers and the author of numerous technical articles.

Merco Nordstrom Managers in Conference

Comfort E. Brown, manager eastern division, and E. D. Rogers, manager southern division of the Merco Nordstrom Valve Company, have recently been in San Francisco in conference with the executive offices of the company, which are located in that city

CONVENTION CALENDAR

JANUARY

12-13 Gas Section, Empire State Gas & Electric Association. Annual meeting, Niagara Falls, N. Y.

FEBRUARY

15-16 New England Gas Association. Annual meeting, Boston, Mass.

MARCH

10-11 Accounting Section, Empire State Gas & Electric Association. Annual meeting, Briarcliff Lodge, Briarcliff Manor, N. Y.

13-14 Oklahoma Utilities Association. Annual meeting, Tulsa, Okla.

14-15 Illinois Gas Association. Annual meeting. Springfield, Ill.

APRIL

12-13 Women's Section, Empire State Gas & Electric Association. Annual meeting, New York City.

17-19 Southern Gas Association. Annual meeting, Jacksonville, Fla.

24-26 Midwest Gas Association. Annual meeting. Place of meeting not set as yet.

MAY

3-5 Southwest Public Service Association. Annual meeting, Dallas, Tex.

6-11 Natural Gas Department, American Gas Association. Annual meeting, Texas State Fair Grounds, Dallas, Tex.

JUNE

21-22 Canadian Gas Associated. Annual meeting, Hamilton, Ont.

28-29 Commercial Section, Empire State Gas & Electric Association. Annual meeting, Utica, N. Y.

9,000,000 Cubic Feet

additional, off-peak, annual GAS LOAD put on the Gas Company's books in one city by one appliance—The Home Incinerator

You can add this amount or any part of it you want to—to your 1928 gas sales increase. Description of the simple plan which helped build this load was mailed you early this month. Fit it into your 1928 program.

Call on us to help you get the results you want. We will gladly do it.

HOME INCINERATOR CO.
Milwaukee Wisconsin

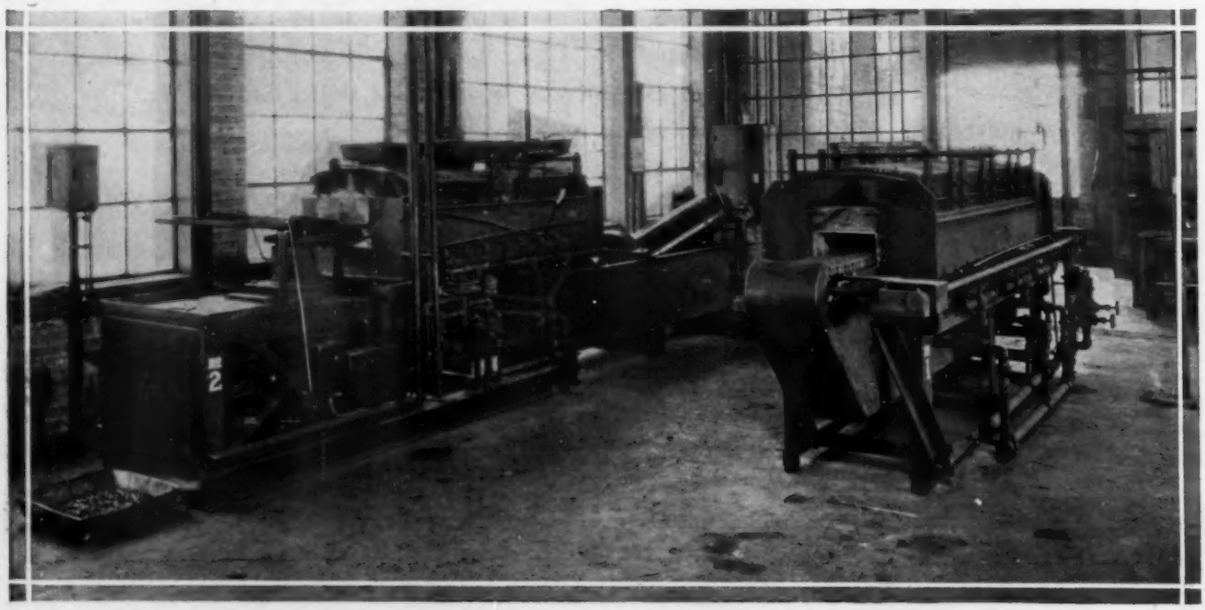
The Home Incinerator

SUPERIOR

Gas Meters
Provers
Service
Cleaners
Diaphragms

SUPERIOR METER CO.
167 - 41st Street
Brooklyn, N. Y.

"Very Satisfactory," says Danly, referring to work treated in American Heating Machine



"I have a report from Mr. Henry, on our Reciprocating Hearth Furnace, that I think will be of interest to you.

"Last month the following work was put through this furnace:

Tappets	30,645 lbs.
Rivets and Pins	12,333
Bushings	1,315
Dowel Pins	3,929
Bicycle Cones	844
	49,066 lbs.

"The furnace was in operation 260 hours, producing an average of 188 lbs. per hour.

"All of the work was very satisfactory.

"DANLY MACHINE SPECIALTIES, INC. "P. H. Danly, Vice-Pres."

American Gas Furnace Engineers will make an analysis of your heat-treating costs without obligation

AMERICAN GAS FURNACE CO.

Main Office and Works: Elizabeth, N. J.

We Make

Automatic Heat Controllers
Automatic Quenching Tanks
Blowers
Blowpipes or Blowtorches, Hand and Stand
Boosters, Gas
Brass Melters
Brazing Furnaces and Tables
Burners
Burners for Electric Lamp Bulb Manufacture
Carbonizing Machines
Cyanide Furnaces
Cylindrical Furnaces
Forges
Forges, Glass Bending
Hardening Hammers
Heating Machines
Melting Furnaces
Muffle Furnaces
Oil-Tempering Furnaces
Oven Furnaces
Plating Furnaces
Rivet Heaters
Soft Metal and Lead Hardening Furnaces
Soldering Iron Heaters
Sweep Reducing Furnaces
Tempering Plates
Tire Heaters
Tube-Heating Furnaces
Every Type of Gas Blast Burner, Furnace and Heating Machine for Industrial Uses.

"Andy Iron" Says—

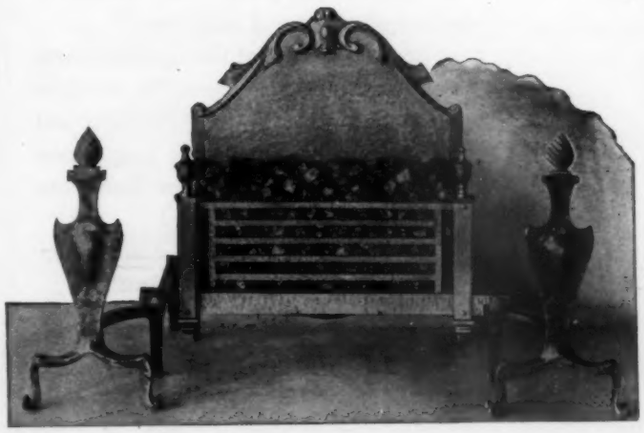
A perfesser from out Wisconsin way wuz tellin' a meetin' at Columby University, N' York, tother day, that Success is due to good luck and just enuf brainz not to stand in the way uv it.

There's a hull lot of wisdom in thet perfessers remarks thet gas men can take tew heart and profit by it. Fer instens: There's a lot of luck for them to hev "Homestead Fires" on hand, when ev'body is wantin' em, and they only hev to be shown to be gobbled up, they look so 'nacherel and dekarative,' so my grandarter Helen sez I presume, frum whut I know of yew gas men, there's none of yew but what hez brains enuf, as the perfesser pints out, not to stand in the way of success, when it is lookin' for yew.

Yours truly
Andy Iron

STYLES CHANGE

Modern home owners are demanding beauty as well as utility in their room warming appliances; and the heating appliances that meet these requirements are the ones that move rapidly.



Homestead "Coalfire"

Homestead Fires "Woodfires" and "Coalfires" are equally productive of all the clean, radiant heat required to make any room in the house comfortable, besides furnishing an ornamental motif that readily combines with any decorative scheme.

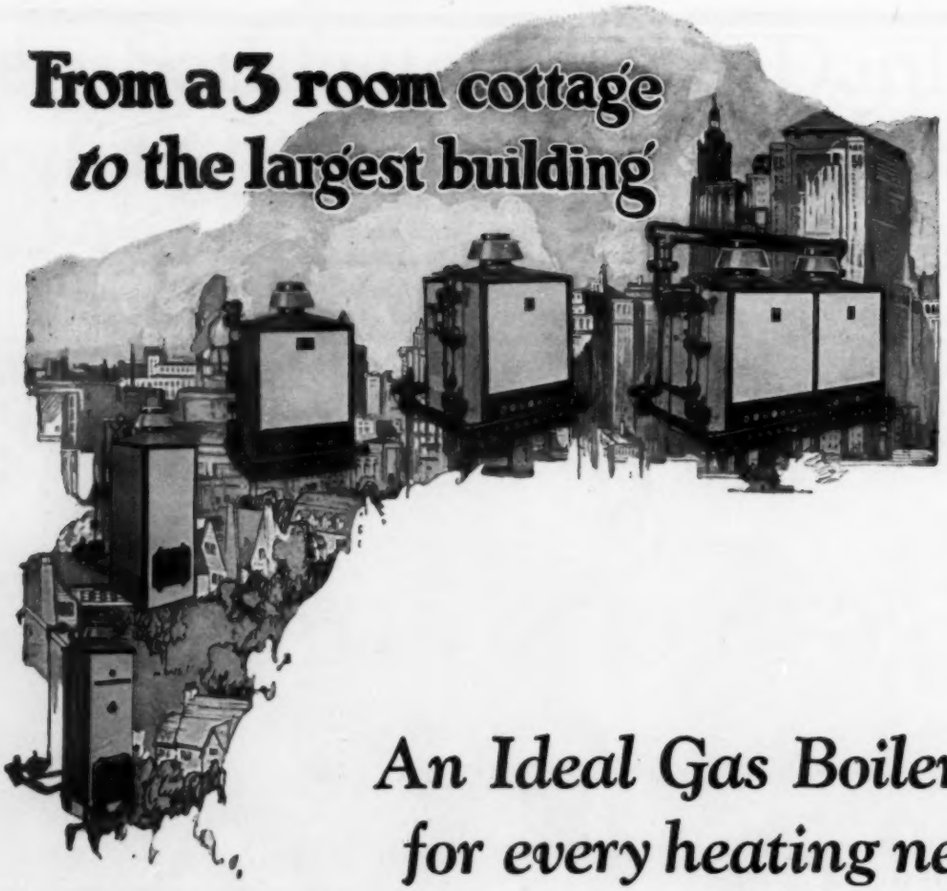
Homestead Fires can be offered to your customer with the knowledge that nothing has been left undone to produce the most practical and artistic room warming appliances, which the public has been quick to appreciate.

It will be to their decided advantage for Commercial Managers to display and demonstrate Homestead Fires in the Company showrooms — quick sales usually follow.

HOMESTEAD HEATER COMPANY, Inc.

Selvage Street and Fabyan Place WALTER KENNEDY, PRESIDENT **Newark, N. J., U. S. A.**

From a 3 room cottage to the largest building



An Ideal Gas Boiler for every heating need

WHETHER you are heating your factory, your office building, or your home, there's a proper Ideal Gas Boiler to give you absolutely automatic, care-free heat.

Or you will find that an Ideal Gas Boiler will furnish low-pressure steam or hot water for a wide variety of industrial and commercial uses.

Where reliability and uniformity of heat supply are paramount, Ideal Gas Boilers are particularly necessary and economical.

In your home, your Ideal Gas Boiler eliminates all noise, dirt, odor, labor. No ashes to haul out. No oil tank to install. No electrical hook-up to get out of order. Your heat comes steadily—as you need it—by pipe line from your gas company's holder.

Write today for full information—keep abreast of this *modern* heating method!

LET US HELP YOU SOLVE YOUR PARTICULAR HEATING PROBLEM.
CLIP THE COUPON FOR FULL INFORMATION.

AMERICAN GAS PRODUCTS CORP.
376 Lafayette St., New York City, N.Y.

Gentlemen: I am interested in Ideal Gas Boilers for the uses checked below. Please send me full information. IG 1

☐ Plant heating ☐ Low-pressure steam for industrial use

☐ House heating ☐ Hot water supply

Name.....

Address.....

IDEAL GAS BOILERS

Product of the AMERICAN RADIATOR COMPANY

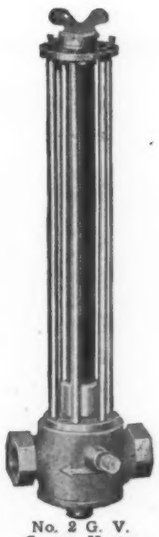
American Gas Products Corporation
376 Lafayette Street DISTRIBUTORS New York

Just the proper thing for the Gas Heated Garage

The ROBERTSHAW THROTTLING TYPE

Garage Heater Thermostat

Keeps the Garage at a Uniform Temperature Regardless of Cold Weather or Sudden Temperature Changes



No. 2 G. V. Garage Heater Thermostat

Adaptable for Use with Practically All Makes of Gas Fired Garage Heaters

Easily Installed — Rigidly Constructed

Adjustable to maintain any temperature from 40° to 80° F.

Showing a Typical Installation of the Robertshaw Throttling Type Garage Heater Thermostat

The Uniform Temperature of the Garage affords many advantages that the Car owner will readily appreciate. First of all, it makes a comfortable workroom, the car starts easily, no danger of freezing the Radiator or Battery, no cracked cylinders, no clogged oil pipes, and the uniformity of temperature preserves paint and tire, and saves gas by using no more than is actually required to maintain the desired temperature.

Recommend the Robertshaw Garage Heater Thermostat to your customers.

They will appreciate the suggestion and you will profit by the Resale Discount.

Write for complete information, and if you want a supply of Garage Thermostat Circulars imprinted with your name and address, for mailing to your customers, let us know.

Its Successful Performance is fully Guaranteed

THE ROBERTSHAW THERMOSTAT CO.

YOUNGWOOD, PA.

New Data on a Live Subject

—automatic control for house heating plants

Send for your copy to-day!

House heating holds the center of the stage in the gas industry today. Here are the latest facts on a phase of gas heating which is gaining ever greater recognition as experience accumulates in this new, expanding field. This up-to-date booklet, published by the recognized leader in heat regulation, deals with vital factors in the operation of gas-fired systems and contains complete descriptions of the most recent devices for automatic control.

The contents of this booklet should be part of your working equipment, if you are interested in developing gas heating in your community. Mail the coupon for free copy.

MINNEAPOLIS HONEYWELL REGULATOR CO.
Executive Offices: Minneapolis. Factories: Minneapolis and Wabash

Minneapolis Heat Regulator Co.
408 E. 28th St., Minneapolis, Minn.

Send free copy of your latest booklet on Automatic Control for Gas-Fired Heating Plants.

Name.....
Company.....
Address.....
City..... ....State.....

HUMAN nature is always more interested in what a product will do for it than it is in the product itself.

Instead of selling radiant heaters at the lowest possible price isn't it a good deal sounder and more profitable to sell *radiant heat* and the best appliance for delivering that heat—particularly now that health authorities enthusiastically recommend this form of "live, luminous energy" to relieve the "stagnant, dark heat of steam pipes and shut up rooms?"

The basic RAY-GLO principles of high flame temperature and incandescence are exactly fitted to this new demand for the intense, invigorating quality of sunshine in home heating. Its sturdy construction, easy accessibility and complete absence of adjustments are further characteristics of the *quality* gas appliance.

For your further consideration, we will gladly send a full report on present trends in home heating, compiled from eminent authorities. It will strongly influence many selling campaigns this season.

THE J. H. GRAYSON MFG. COMPANY, Athens, Ohio.

No Colds
this Winter!
25.00
DRY air, too hot around the head and drafty around the feet— that's what Science blames most for Winter colds and sickness.
Use less furnace heat and more Ray-Glo Radiant Heat, just like Nature's sunshine. It leaves the air fresh and pleasant, keeps feet and ankles warmest.
RAY-GLO
RADIANT HEATERS
give highest heating efficiency known without need of any adjustments. Come to see our selections.

EVERY RADIANT HEATER AVERAGES 20,000 CUBIC FEET OF GAS CONSUMED EACH YEAR

History Repeats Itself
in the protection of steel pipe lines

The Largest of Steel Water Mains

AMERICA'S largest steel pipe line carries water from the Moklumne River to the East Bay District of San Francisco. It is protected by our products which, in fact, have been used to protect fully 90% of the important steel water lines laid in this country in the last 11 years. And now "history repeats itself" in the field of natural and manufactured gas. For example—

The Two Largest Natural Gas Lines in the World

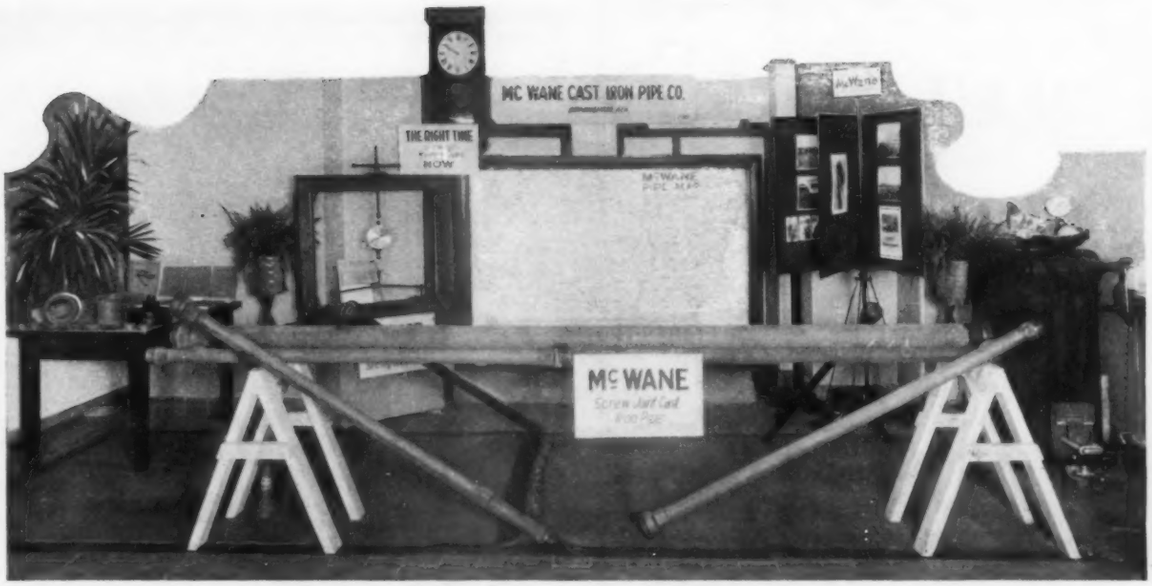
are now using the same forms of protection. Our coating — BITUMASTIC ENAMEL — has been applied to 85 miles of the Interstate Gas Line which runs between Monroe and Baton Rouge, La., and it is being applied to the entire length of the new Empire Line which extends for 250 miles between the Texas Panhandle and Wichita, Kan.

Extensive use of BITUMASTIC ENAMEL is also being made by the distributors of manufactured gas for, although these lines are not as long, gas mains now represent approximately 60% of the gas company's investment. To protect this large investment the engineers in charge are choosing the one pipe coating which has demonstrated its ability to serve unfailingly for more than forty years.

BITUMASTIC
REG. U.S. PAT. OFF.
ENAMEL

Write for our complete book—"The Protection of Pipe Lines"

Wailes Dove-Hermiston Corporation
Whitehall Building, New York
Philadelphia Cleveland Chicago Tulsa San Francisco



Here's An Echo

of the Chicago Gas Show—the Exhibit of McWane Cast Iron Pipe that attracted you in October.

You recall it now—

The Pipe with the 6 Strong Points

1. Screwed joints, guaranteed tight under 100 lbs. gas pressure.
2. Joints equally effective for high or low pressures. Change your pressure at will—now or a hundred years from now.
3. Pipe more flexible than any cast iron pipe you ever saw before—because green-sand-cast.
4. Pipe that you can lay and forget. No rust, no coating, no coddling.
5. Lowest cost per year—always. And often lowest cost per foot as well.
6. More of it being used for gas mains every year.

You only need a wrench to lay McWane screw joint cast iron pipe. Nothing simpler, nothing tighter has been devised for connecting gas pipe than this screw joint. Sizes 1¼ through 6 inches. Lengths 15 to 24 feet, assembled.

No matter what kind of pipe you use, send us your inquiries. Then compare point for point, price for price. No obligation.

We make Bell and Spigot, Plain End, and Precalked (lead) Joint pipe. Standard lengths. Interchangeable with all other standard pipe.

McWane Cast Iron Pipe Company

Birmingham, Alabama

819 Bankers Trust Bldg. Philadelphia, Pa.
208 So. LaSalle St. Chicago, Ill.
1807 Santa Fe Bldg. Dallas, Texas.

PACIFIC STATES CAST IRON AND PIPE COMPANY, PROVO, UTAH

608 Subway Term. Bldg. Los Angeles, Calif.
611 Spalding Bldg. Portland, Oregon
149 West 2nd South Salt Lake City, Utah
922 Hunter-Dulin Bldg. San Francisco, Calif.

FULTON
HIGH PRESSURE
GOVERNORS

Performance in numerous installations prove that the Duplex Sensitive Governor excels all others in simplicity and accuracy

These governors are especially adapted for the requirements of gas companies, where the high pressure transmission system is in use.

They will reduce a high and varying inlet pressure to a low and unvarying delivery pressure within a small fraction of an inch.

The Fulton Duplex Sensitive Gas Governor

Constructed of materials resistent to the chemical action of manufactured gases; all frictional surfaces eliminated; the diaphragm surface increased to secure the utmost delicacy of regulation.

Action is positive and independent—no auxiliary regulators complicate operation. Designed for highest efficiency—no machinery to get out of order—nothing but ordinary valve wear experienced. Easily and quickly installed and needs little attention afterward.

SEND FOR CATALOG

and details of this governor or any other pressure controlling device you may need.

The Chaplin-Fulton Mfg. Co.

Organized 1884—Oldest Builders of Gas Regulators in the Country. Built in All Sizes, From 1 Inch to 24 Inches: For All Service. 1 Oz. up to 1,600 Lbs. Pressure to Square Inch.

28-40 Penn Avenue **Pittsburgh, Pa.**

In Carburetting Water Gas

A thorough cracking of oils and minimum formation of carbon or naphthalene can be obtained more surely where Bristol's Recording Pyrometers are used to aid in controlling temperatures.

As the Bristol Instrument operates on the thermo-electric principle, fire-ends are installed in the carburetor and superheater, with leads extending to the recorder which may be conveniently mounted near the operating levers and handy to operators. As the blow starts, the instrument records the exact rise in temperatures. By glancing at this record, oil injection can be made at precisely the right temperature, thus insuring a good make every time.

Aside from lengthening the service of fire brick and saving oil, such practice sends crude gas to the holder in a much cleaner condition, thus lightening the load carried by cleansing apparatus.

Bristol's Recording Pyrometers are simple and rugged in construction, requiring very little attention. They are designed for actual plant service, and have proven their ability to stand up under all ordinary conditions.

Consult our engineers without obligation

The Bristol Company *Waterbury, Connecticut*

FOR 38 YEARS — MAKERS OF — BRISTOL'S — RECORDING INSTRUMENTS

MONO-CAST PIPE

weathers bending strains

FLEXIBILITY and sturdiness have kept this old tree standing for years against strains and stresses that have destroyed its less adaptable fellows.

Flexibility, sturdiness and adaptability to service conditions enable MONO-CAST PIPE to absorb (and thereby withstand) shock.

MONO-CAST PIPE is flexible and will therefore deliver service for many years. This "bendability" is but one of the dozen points that recommend MONO-CAST to the thoughtful buyer.

Costs Less to Buy
Costs Less to Lay

More than 2,500,000 feet of Mono-cast pipe are now in service.

AMERICAN CAST IRON PIPE COMPANY
BIRMINGHAM, ALA.

TRADE ACIPCO MONO-CAST CENTRIFUGAL MARK PIPE
BELL AND SPIGOT

Repairs as Good or Better Than the Original Construction by using

HYTEMPITE

(Reg. U. S. Pat. Off.)

The Standard of Comparison in High Temperature Cements

Retorts, Jamb Joints, Furnace Walls, Arches and Baffles are quickly and efficiently repaired with HYTEMPITE either by hand or with the Quigley Gun.

HYTEMPITE is used by hundreds of Gas Companies for laying up firebrick, and (mixed with crushed old firebrick or Ganisand) for patching and repairing refractory linings, making special shapes and tile, etc.

Keep a drum of HYTEMPITE on hand for quick repairs.

Quigley Furnace Specialties Co., Inc.

26 Cortlandt St. **New York**

Prompt Service—Stock in all Industrial Centers.

BAROMETERS

PHILADELPHIA, THE WORKSHOP OF THE WORLD, has 14,000 Manufacturing Establishments of which many have World-Wide Reputations.

"PRINCO" STANDARD FORTIN MERCURIAL BAROMETERS

are in World-Wide use because they, too, have a "World-Wide Reputation"

THEY ARE GOOD BAROMETERS
THEY ARE REASONABLE IN PRICE!

For more than a decade they have been made in such manner that they can be shipped safely and successfully wherever there is a common carrier. This has been recognized as an achievement in Barometry.

PRECISION THERMOMETER & INSTRUMENT COMPANY

1439 BRANDYWINE STREET - - - - - - PHILADELPHIA, PA.

One of these is better because it's

Scale Free *and* Spellerized

HERE is *ONE* pipe that is different from any other. The SCALE FREE Process, plus Spellerizing, distinguishes this pipe in a way that not only makes it different from a manufacturing standpoint but actually gives it added life in gas service, making it particularly valuable in those sections where corrosion is a problem.

In the Scale Free Process, "NATIONAL" Butt-weld Pipe (sizes ½ to 3-inch) is subjected to special rolling operations that remove the mill-scale, acknowledged to be one of the principal causes of interior corrosion, especially "pitting." Scale is electronegative to the pipe metal and sets up galvanic action causing pitting around the scale areas, thereby shortening the life of the pipe.

Scale free pipe means: not only minimized corrosion because of elimination of scale, but a clean, smooth surface for the close adherence of galvanizing, making a better galvanized pipe—no scale to drop off, taking the galvanizing with it and leaving bare spots of unprotected metal to corrode. Absence of scale also means full delivery capacity and no trouble from damaged valve seats or clogging of small orifices, and the additional rolling increases the strength at the weld about 20 per cent, making it especially desirable for the fabrication of bends and coils.

We will be glad to send Bulletin No. 7, which fully explains the advantages of scale free pipe—the pipe that is especially made to resist corrosion.

There's only 1 Scale Free Spellerized Pipe

NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES IN THE LARGER CITIES

"NATIONAL"

"In the Heart of Cleveland"

AUDITORIUM HOTEL

EAST 6TH AND ST. CLAIR AVE.

TO THE PUBLIC:

Are you wondering why we have built "Another" Hotel in Cleveland. One must have a good reason for spending nearly two million dollars. We have a reason worth far more than that.

Every hotel operator gives "His best efforts for your comfort." We have centered our efforts around one ideal desire, "To make you happy."

There must be something back of that desire. You can easily prove it by coming here just once.

Sincerely yours,
James L. Smith
Manager

Our Service Makes You Happy

Make this Distinction

SILICA AND GRAPHITE MIXTURES vs. A NATURAL COMBINATION

Since Dixon's Silica-Graphite Paint was first made, 65 odd years ago, many graphite paints have appeared on the market. None but Dixon's, however, is made with the famous Ticonderoga Flake Graphite in natural combination with silica.

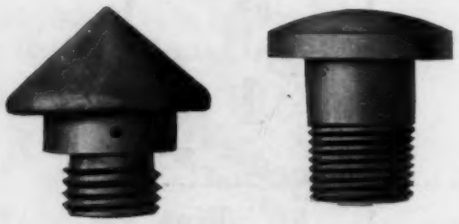
We say without hesitation that this pigment makes a more durable and efficient paint. And we know because we use in our various products every known grade of graphite. We have tested many formulas, and we have evidence in many remarkable service records made by the original product.

You can not do better than to use and specify Dixon's Silica-Graphite Paint for all exposed metal or wood work. Write for Booklet 231-B.

DIXON'S
SILICA-GRAPHITE PAINT

JOSEPH DIXON CRUCIBLE COMPANY
Jersey City New Jersey
1827 One Hundredth Anniversary 1927

GAS OUTLETS
Made of LAVA

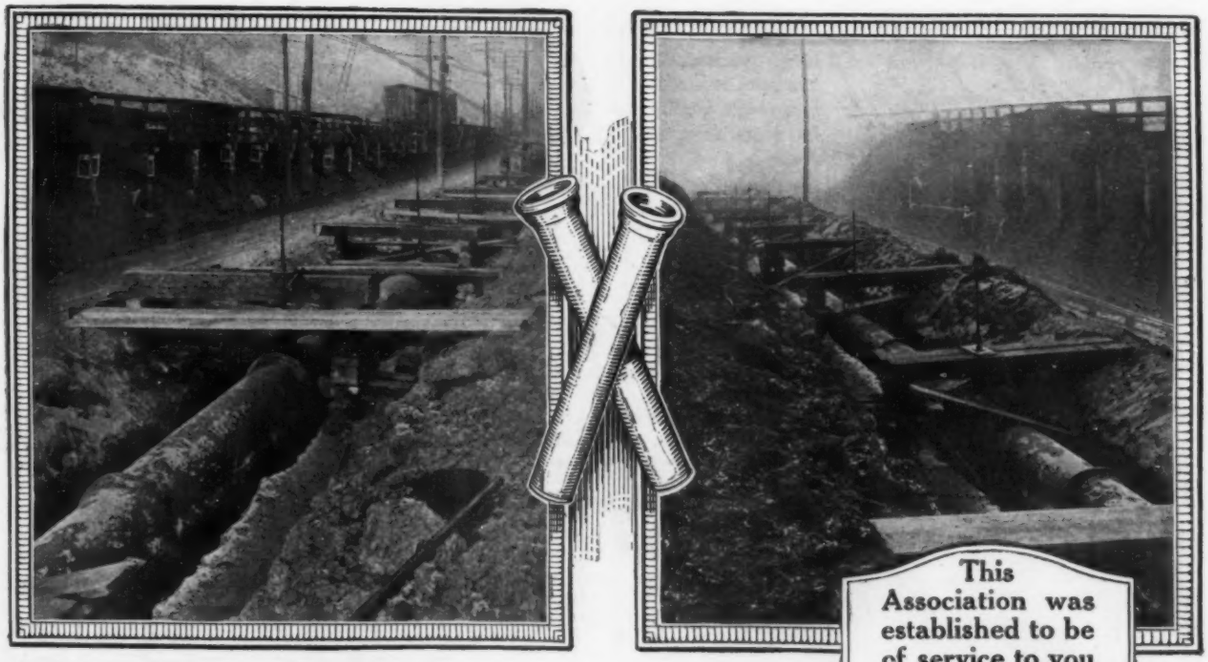


There are many forms of Lava outlets available for use with manufactured or natural gas.

Parts which we have made have, through wide commercial use, proven the superiority of Lava over other materials as a seat for gas combustion.

WE INVITE CORRESPONDENCE

American Lava Corporation
29-59 William St. Chattanooga, Tenn.
Manufacturers of Lava Tips & Heat Resistant Insulators



Its flexibility is an established fact

This Cast Iron Pipe Installation in Pittsburgh is being raised bodily to a new level of a re-graded street, without interfering with heavy traffic in the slightest.

THE strength and flexibility of Cast Iron Pipe lines with the Bell and Spigot Joint enable engineers to raise or lower such lines without interrupting the service in any way.

This is of the greatest importance especially where an interruption to the water or gas service in industrial areas would result in a serious economic loss.

For permanence and low maintenance cost and adaptability to industrial needs Cast Iron Pipe has no equal.

CAST IRON PIPE RESEARCH ASSOCIATION
People's Gas Building, Chicago, Ill.

This Association was established to be of service to you

Information regarding the various accepted methods of handling alterations and moving of gas or water mains will be gladly forwarded to you.

Its functions are:

1. Collecting and compiling data with reference to Cast Iron Pipe and fittings for all purposes.
2. Assisting engineers in solving difficult and unusual problems.
3. Educating the public by national advertising in the importance of having up-to-date waterworks.

—It has nothing to sell.

Engineers, municipal authorities and contractors are invited to write for special literature on the subject of water systems.

Of especial importance is a reprint of an article on the "two mains system." Send for a copy.

BELL *and* SPIGOT JOINT—*the accepted standard for underground construction.*

CAST IRON PIPE

— In continuous service for over 250 years

Job 8539—PBS

Lux Material

Never varies. It has been of a uniform high quality for more than 25 years.

THE ALPHA-LUX COMPANY, Inc.
192 FRONT ST., NEW YORK CITY
Shipping points convenient to all parts of the country

For long time contact, low temperature or any severe purifying service. **Lux-Sponge** THE PERFECT READY MIXED OXIDE

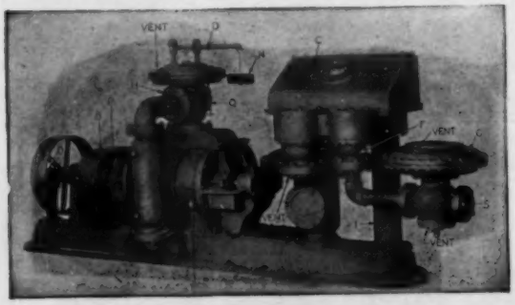
GROBLE REGULATORS & GOVERNORS

for Artificial or Natural Gas.

Regulators	Governors
High Pressure Service	District Station
Intermediate Pressure Service	Holder
Low Pressure Service	
High Pressure Line	Intermediate Pressure

Relief Valves Back Pressure Valves
Automatic Quick Closing Anti-Vacuum Valves
We Solicit Your Inquiries
GROBLE GAS REGULATOR COMPANY
Anderson, Indiana

THE IMPROVED KEMP SYSTEM



Opens up Bigger Opportunities for the use of Gas

For many years we have specialized in methods for greater efficiency in the utilization of gas for industrial heating operations. Through energetic research we have found opportunities for the use of gas, undiscovered by the average gas man. To meet the requirements of our findings, we have developed the improved Kemp Automatic Gas System, whereby improvements and economies can be realized that will be productive of a larger use of gas and prove satisfactory to both user and gas company alike.

Send for new descriptive catalog, or, better still, request one of our engineers to call—it will not obligate you.

THE C. M. KEMP MFG. CO.
405-415 East Oliver Street Baltimore, Md.

ISBELL-PORTER COMPANY

Engineers and Contractors for Complete Gas Works

I-P Co.

Manufacturers of All Kinds of Gas Apparatus

NEWARK - NEW JERSEY

Specialists in Fire Clay Refractories
With Over 30 Years Experience

Fire Brick for oil fuel furnaces, boilers and metallurgical furnaces.
Tiles and blocks of special shape for all purposes.
Muffles and planches, Coal gas benches.
Brass furnace linings, Water gas linings, Cupola linings.
Clay and Silica Retorts and settings.
Ground fire clay, Ground fire brick, Plastic fire brick, Refractory Cements.

THE JERSEY CITY REFRACTORIES CO.
135 WEST SIDE AVENUE *A. E. ACHESON* JERSEY CITY, N. J.

Improved

IRON BORING OXIDE

Gas Purification at Lowest Cost

Our Improved Iron Boring Oxide will *remove* the largest amount of H_2S *at lowest cost.* It has earned an enviable reputation for its *low resistance to flow of gas,* and uniform purifying value at different stages of its active life as well.

The outstanding features of Improved Iron Boring Oxide are

ACTIVITY—ENDURANCE
REVIVABILITY

Let Us Help Solve Your Purifying Problems

GAS PURIFYING MATERIALS CO.

Foot of Halsey Street Long Island City, N. Y.

Branch Yard to Serve New England

Providence, Rhode Island

FLANGE END

VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW

VALVE MANUFACTURING COMPANY

TROY, N. Y.

New York 62 Gold Street | Boston Tremont Bldg. | Philadelphia Harrison Building

Chicago The Rookery | Pittsburgh Oliver Bldg. | Kansas City R. A. Long Bldg.

RITER-CONLEY CO.

STEEL CONSTRUCTION

PITTSBURGH

STEEL PLATEWORK

FOR

THE GAS INDUSTRY

Gas Holders
Pressure Tanks
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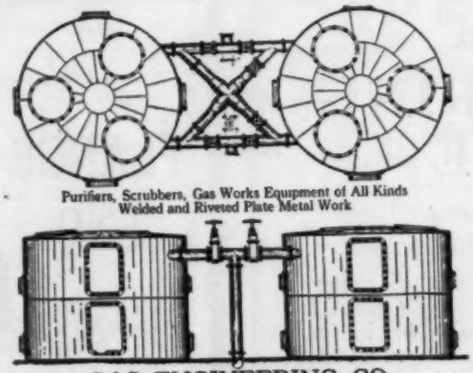

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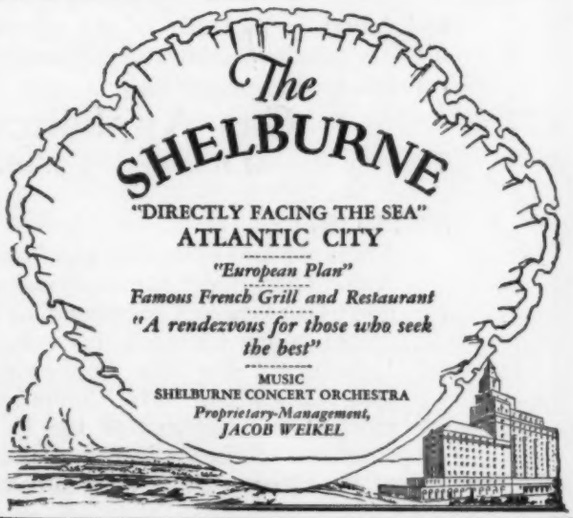

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The only manual of laboratory practice in gas appliance testing now in print.

AUTHORITY

Prepared and edited by the Technical Section of the Pacific Coast Gas Association under the supervision of E. L. Hall of the Portland (Oregon) Gas & Coke Company, Chairman of the Section. The special committee which compiled this volume was headed by R. M. Conner, now Director of the Gas Appliance Testing Laboratory of the American Gas Association. Mr. Conner was assisted by Walter M. Berry, formerly Gas Engineer of the Bureau of Standards and now Executive Engineer of the California Gas Research Council, and Prof. S. H. Graf of the Oregon State Agricultural College.

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American Gas Products Corp.
Garage
Room
Grayson Mfg. Co., The J. H.

HEATING MACHINES
American Gas Furnace Co.

HOISTS
C. W. Hunt Co., Inc.

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Koppers Construction Co.
Riter-Conley Co.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.

HOPPERS—COAL AND COKE
Bartlett-Hayward Co.
Cruse-Kemper Co.
Riter-Conley Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.

HOTELS
Shelburne Hotel.
Hotel Gibson.

HYDROGEN GAS APPARATUS
Bartlett-Hayward Co.
Gas Engineering Co.
The Improved Equipment Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.

HYDROMETERS
Precision Ther. & Inst. Co.

INCINERATORS
Home Incinerator Co.

INDUSTRIAL FUEL APPLIANCE
American Gas Furnace Co.

INDUSTRIAL GAS MIXERS
Geo. D. Roper Corp.

INDUSTRIAL TRACK
C. W. Hunt Co., Inc.

INSTRUMENTS
The Bristol Co.
Metric Metal Works
Precision Ther. & Inst. Co.
P. H. & F. M. Roots Co.
The U. G. I. Contracting Co.
Recording
Alpha-Lux Company, Inc.
Superior Meter Co.

JOINTS
Semet-Solvay Engineering Corp.
U. S. Cast Iron Pipe & Foundry Co.
Insulating
Semet-Solvay Engineering Corp.
The U. G. I. Contracting Co.

JOINT RUNNERS
Safety Gas Main Stopper Co.

LAMPS
General Gas Light Co.
Kitson Co.
Welsbach Co.

LAMP POSTS
General Gas Light Co.
Kitson Co.
Welsbach Street Lighting Co. of America

MANILA & WIRE ROPE
C. W. Hunt Co., Inc.

MANTLES
General Gas Light Co.
Welsbach Co.

MASKS—GAS
Meiters
American Gas Furnace Co.
Connelly Iron Sponge & Gov. Co.
The Safety Gas Main Stopper Co

MAST & GAFF OUTFITS
C. W. Hunt Co., Inc.

MEASURING CHUTES
C. W. Hunt Co., Inc.

METERS
Air
American Meter Co.
The Connersville Blower Co.
John J. Griffin & Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works
Neptune Meter Co.
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
The U. G. I. Contracting Co.
Artificial
American Meter Co.
John J. Griffin & Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Neptune Meter Co.
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Demand
D. McDonald & Co.
Dry
American Meter Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
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The Sprague Meter Co.
Superior Meter Co.
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Natural Gas
American Meter Co.
The Connersville Blower Co.
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Helme & McIlhenny
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Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
P. H. & F. M. Roots Co.
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
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Prepayment
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The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
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The Gas Machinery Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
P. H. & F. M. Roots Co.
Superior Meter Co.
Nathaniel Tufts Meter Works
Steam
The U. G. I. Contracting Co.
Test
American Meter Co.
John J. Griffin & Co.
Lambert Meter Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works

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American Meter Co.
Bartlett-Hayward Co.
S. R. Dresser Manufacturing Co.
D. McDonald & Co.
Maryland Meter Works
The Sprague Meter Co.
Superior Meter Co.
Nathaniel Tufts Meter Works

MIXERS, GAS
The C. M. Kemp Mfg. Co.
Geo. D. Roper Corp.
Smoot Engineering Corp.

MOTOR CARS
C. W. Hunt Co., Inc.

NAPHTHALENE EXTRACTORS
Semet-Solvay Engineering Corp.
Western Gas Consruction Co.

OVENS COKE AND GAS
Carl Still, Incorporated.
The Gas Machinery Co.
The Improved Equipment Co.
The Koppers Construction Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.

OXIDE
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Gas Purifying Materials Co., Inc
E. J. Lavino & Co.

PACKING
Asbestos
Jute
The Safety Gas Main Stopper Co.

PAINTS
Jos. Dixon Crucible Co.
The U. G. I. Contracting Co.
Wailes Dove-Hermiston Corp.

PAINTS, ANTI ACID AND ALKALI
Quigley Furnace Spec. Co., Inc.

PAINTS
Graphite
Jos. Dixon Crucible Co.

PAINTS, RUSTPROOF
Quigley Furnace Spec. Co., Inc.

PHOTOMETERS (JET)
Connelly Iron Sponge & Gov. Co.

PHOTOMETERS
Lambert Meter Co.
The U. G. I. Contracting Co.
Warren Foundry & Pipe Co.

PIPE
Bartlett-Hayward Co.
National Tube Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
U. S. Cast Iron Pipe & Fdy. Co.
Western Gas Construction Co.
Bell
Donaldson Iron Co.
Cast Iron
James B. Clow & Sons
Donaldson Iron Co.
McWane Cast Iron Pipe Co.
Flange
Donaldson Iron Co.
U. S. Cast Iron Pipe & Fdy. Co.
Spigot
Donaldson Iron Co.
Steel
Smith Corpn., A. O.
Welded Steel
The Stacey Mfg. Co.
Semet-Solvay Engineering Corp.

PIPE COATINGS
Wailes Dove-Hermiston Corp.

PIPE CUTTERS
Cast Iron Pipe Publicity Bureau
Ratchet
W. W. Strickler & Bros.

PRESSURE HOLDERS
The Stacey Bros. Gas Const. Co.

PLATES
Floor
Banner Iron Works
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Co.
Russell Engineering Co.
The Stacey Mfg. Co.

PLUGS SERVICE AND MAIN
Rubber
Soft Wood
The C. M. Kemp Mfg. Co.
Soft Wood
The Safety Gas Main Stopper Co.

PRODUCER GAS PLANT
Gas Engineering Co.
The Gas Machinery Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

PROVERS—METER
American Meter Co.
Helme & McIlhenny
Lambert Meter Co.
D. McDonald & Co.
Pittsburgh Equitable Meter Co.
Superior Meter Co.

5-A Meter

A-METERS

	Capacity at 0.5 in. differential
5-A	175 cubic feet per hour
10-A	375 cubic feet per hour
30-A	875 cubic feet per hour
60-A	1500 cubic feet per hour
150-A	3400 cubic feet per hour

B-METERS

	Capacity at 0.5 in. differential
5-B meter	150 cubic feet per hour
10-B meter	300 cubic feet per hour
20-B meter	450 cubic feet per hour
30-B meter	600 cubic feet per hour
60-B meter	1300 cubic feet per hour
100-B meter	1800 cubic feet per hour

5-B Meter

HELME & McILHENNY

OF

AMERICAN METER COMPANY
INCORPORATED

17th and Clearfield Streets
Philadelphia, Pa.

ESTABLISHED 1848

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Superior Meter Co.
Drip
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D. McDonald & Co.
George D. Roper Corp.
Gas Bag
The Safety Gas Main Stopper Co.
Hand
George D. Roper Corp.
Oil
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
Semet Solvay Engineering Corp.
Power
George D. Roper Corp.
Pressure
D. McDonald & Co.
Service
The Safety Gas Main Stopper Co.
Tar
The Connersville Blower Co.
D. McDonald & Co.
George D. Roper Corp.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Vacuum
D. McDonald & Co.
Water
George D. Roper Corp.

PURIFIERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

PURIFYING MATERIALS
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Cruse-Kemper Co.
Gas Purifying Materials Co., Inc.
Lavino, E. J., & Co.

PURIFIER TRAYS
Bartlett-Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.

PYROMETERS
Indicating
Recording
The Bristol Co.

RADIATORS
Gas Steam
Gas Water
James B. Clow & Sons

RANGES—GAS
American Stove Co.
Electric Porcelain & Mfg. Co.
Geo. D. Roper Corp.

REFRACTORY CEMENTS
Quigley Furnace Spec. Co., Inc.
Walsh Fire-Clay Products Co.

REFRACTORY GUN
Quigley Furnace Spec. Co., Inc.

REFRACTORY LININGS
Alpha-Lux Company, Inc.
The Gas Machinery Co.
The Jersey City Refractories Co. Inc.
E. J. Lavino & Co.
Russell Engineering Co.
Quigley Furnace Spec. Co., Inc.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
Walsh Fire-Clay Products Co.

REGULATORS
American Stove Co.
The Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Isbell-Porter Co.
Groble Gas Regulator Co.
Minneapolis Heat Regulator Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
P. H. & F. M. Roots Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The Sprague Meter Co.
The Wilcolator Co.

RETORT CEMENT
Alpha-Lux Company, Inc.
The Improved Equipment Co.
The Jersey City Refractories Co. Inc.
E. J. Lavino & Co.
Quigley Furnace Specialties Co., Inc.
Russell Engineering Co.
Walsh Fire-Clay Products Co.

RETORTS
The Jersey City Refractories Co., Inc.
E. J. Lavino & Co.
Riter-Conley Co.
Walsh Fire-Clay Products Co.
Horizontal and Inclined
Silica and Clay
The Gas Machinery Co.
The Improved Equipment Co.
Russell Engineering Co.
Walsh Fire-Clay Products Co.
Silica and Clay
The Gas Machinery Co.
The Improved Equipment Co.
The Jersey City Refractories Co. Inc.
Russell Engineering Co.
Walsh Fire-Clay Products Co.
Vertical
The U. G. I. Contracting Co.
West Gas Improvement Co.

SCALES
C. W. Hunt Co., Inc.

SCRUBBERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Riter-Conley Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

SERVICE PLUG—RUBBER
The Safety Gas Main Stopper Co.

SKIP HOISTS
C. W. Hunt Co., Inc.

SPONGE
Alpha-Lux Company, Inc.
Connelly Iron Sponge & Gov. Co.
Gas Purifying Materials Co., Inc.
Lavino, E. J., & Co.

STATION METERS
American Meter Co.
The Connersville Blower Co.
The Gas Machinery Co.
Maryland Meter Works
D. McDonald & Co.
Metric Metal Works
Pittsburgh Equitable Meter Co.

STEAM ACCUMULATORS
The Gas Machinery Co.
Semet Solvay Engineering Corp.
Smoot Engineering Corp.
The U. G. I. Contracting Co.

STOPPERS
The Safety Gas Main Stopper Co.

STREET DEPT. EQUIPMENT
The Safety Gas Main Stopper Co.

STOVES—GAS
Electric Porcelain & Mfg. Co.
Geo. D. Roper Corp.

STREET LAMPS
General Gas Light Co.
Kitson Co.
Welsbach Street Lighting Co. of America

SYSTEMS
Combustion Control
The C. M. Kemp Mfg. Co.
Smoot Engineering Corp.

TACHOMETERS
Precision Ther. & Inst. Co.

TANKS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
Riter-Conley Co.
Pittsburg Water Heater Co.
Semet Solvay Engineering Corp.
The Stacey Bros. Gas Constr. Co.
The Stacey Mfg. Co.
Western Gas Construction Co.
High Pressure
The Stacey Mfg. Co.

TAP, SOAP—BINDING
The Safety Gas Main Stopper Co.

TAR DISPLACEMENT SYSTEM
Semet-Solvay Engineering Corp.
Western Gas Construction Co.

TAR DISTILLING PLANTS
Carl Still, Incorporated.
Gas Engineering Co.
The Gas Machinery Co.
Riter-Conley Co.
Semet-Solvay Engineering Corp.
The Stacey Bros. Gas Const. Co.

TAR EXTRACTORS
Bartlett-Hayward Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Co.
The Koppers Construction Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

TEMPERATURE CONTROLLING DEVICE
American Gas Furnace Co.
American Stove Co.
The Bristol Co.
Robertshaw Thermostat Co.
The Wilcolator Co.

TEMPERING AND COLORING MACHINE
American Gas Furnace Co.

THERMOSTATS
The Bristol Co.
Robertshaw Thermostat Co.
The Wilcolator Co.

THERMOMETERS
American Meter Co.
The Bristol Co.
Cooper Oven Thermometer Co.
Lambert Meter Co.
D. McDonald & Co.
Metric Metal Works
Precision Ther. & Inst. Co.
Semet Solvay Engineering Corp.
Superior Meter Co.

TOOLS, PIPE GANG
The Safety Gas Main Stopper Co.

TUBES, BOILER
National Tube Co.

TUB ELEVATORS
C. W. Hunt Co., Inc.

VACUUM GAUGES
Precision Ther. & Inst. Co.

VALVES
Bartlett-Hayward Co.
The Bristol Co.
James B. Clow & Sons
The Gas Machinery Co.
Isbell-Porter Co.
The Ludlow Valve Mfg. Co.
Merco Nordstrom Valve Co.
Metric Metal Works
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

VALVES—COAL AND ASH VALVES
C. W. Hunt Co., Inc.

WASTE HEAT BOILERS
Bartlett-Hayward Co.
The Gas Machinery Co.
Russell Engineering Co.
Semet Solvay Engineering Corp.
The U. G. I. Contracting Co.
West Gas Improvement Co.
Western Gas Construction Co.

WATER GAS APPARATUS
Bartlett-Hayward Co.
The Gas Machinery Co.
Isbell-Porter Co.
Semet Solvay Engineering Corp.
The Stacey Mfg. Co.
The U. G. I. Contracting Co.
Western Gas Construction Co.

WATER GAS GENERATORS
Semet-Solvay Engineering Corp.
Western Gas Const. Co.

WATER HEATERS
Electric Porcelain & Mfg. Co.
James B. Clow & Sons
Welsbach Co.

WEIGH LARRIES
C. W. Hunt Co., Inc.

YARN, CAULKING
The Safety Gas Main Stopper Co.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF AMERICAN GAS JOURNAL.

Published monthly at New York, N. Y., for October 1, 1927.

State of New York }
County of New York } ss.:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Stanton G. Krake, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the American Gas Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of Publisher—American Gas Light Journal, Inc., 53 Park Place, New York, N. Y. Editor—H. M. Riley, Flushing, N. Y. Managing Editor—None. Business Manager—Stanton G. Krake, 319 Washington Avenue, Brooklyn, N. Y.

2. That the owner is American Gas Light Journal, Inc.; Stanton G. Krake, 53 Park Place, New York, stockholder.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

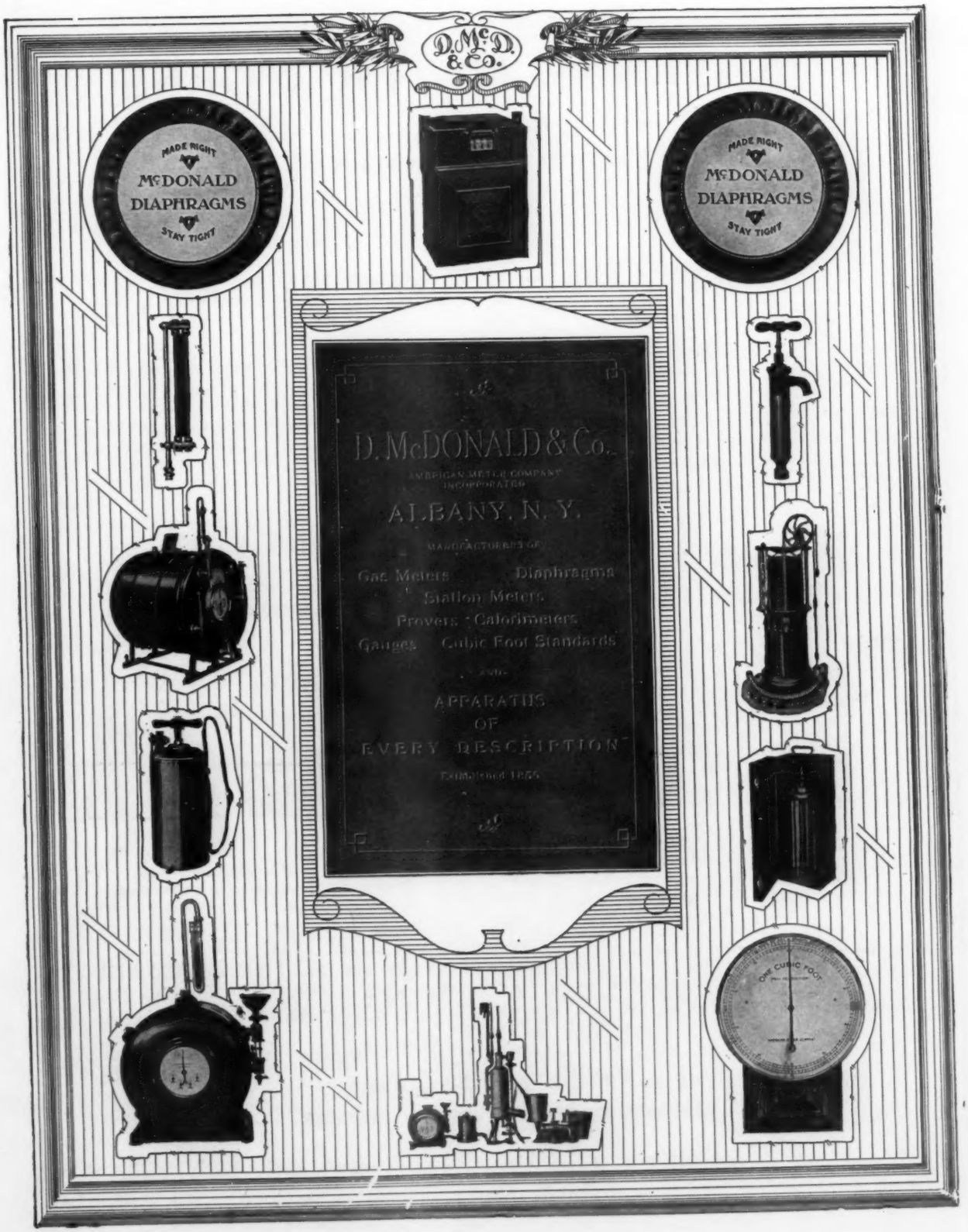
STANTON G. KRAKE,
Business Manager.

Sworn to and subscribed before me this 27th day of September, 1927.

ROZELLE BENNETT.

(Seal)

(My commission expires March 30, 1929.)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Station Meters
Provers Calorimeters
Gauges Cubic Foot Standards
AND
APPARATUS
OF
EVERY DESCRIPTION
Established 1856
ONE CUBIC FOOT

MARYLAND METER WORKS

OF

AMERICAN METER COMPANY

INCORPORATED

BALTIMORE MARYLAND

MARYLAND "C" TYPE METERS

Double the Hourly Capacity, with Slow Speed Operation

Increased Capacity.
Decreased Installation Cost.
Decreased Maintenance Cost.

Decreased cost for service connections per cubic foot capacity on completed installation.

Showing:
Enlarged valves with special guides; Compound levers for double diaphragms.

Showing:
Double diaphragms with equalizers.

The "C" METER is a NEW development in the larger sizes of THE MARYLAND "B" METER, with Tin Case and retaining the established principle for Positive Displacement Measurement in the two-diaphragm, slide-valve method of Operation.

THE MARYLAND "B" TYPE GAS METERS
THE MARYLAND "C" TYPE GAS METERS

Southern Representative
J. E. Montgomery, 1500 South Tenth Ave., Birmingham, Alabama

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LOOKING BACKWARD 30 YEARS

The Use of Gas Has Increased 500% Since 1895

Notwithstanding the loss of a large percentage of gas lighting, the diversified use of gas for domestic and industrial purposes has very materially increased the sales per meter.

The peak demand load is constantly increasing and is of such a nature that volume, as well as pressure, is required for the best results.

From a study of the individual records of several hundred thousand meters, summarized according to the system of the

FOUR CARDINAL POINTS

it is very evident that meters with additional capacity for the volume required hold their proof far better and have a longer life than meters which are overloaded and overworked.

LOOKING AHEAD 30 YEARS

The Lifetime of Our Meters

We strongly urge the placing of meters of greater capacity and volume for domestic and industrial customers where surroundings and industry indicate a prospective increased use of gas.

Capacities at One-Half Inch Loss in Pressure

5-B Capacity	150 Cu. Ft. Per Hour	100-B Capacity	1,800 Cu. Ft. Per Hour
10-B Capacity	300 Cu. Ft. Per Hour	150-B Capacity	3,000 Cu. Ft. Per Hour
20-B Capacity	450 Cu. Ft. Per Hour	250-B Capacity	4,500 Cu. Ft. Per Hour
30-B Capacity	600 Cu. Ft. Per Hour	500-B Capacity	7,500 Cu. Ft. Per Hour
80-B Capacity	1,250 Cu. Ft. Per Hour		

19 Years Experience

With the B-Type Meter

1860 **67 Years in Boston** **1927**

Manufacturing the Glover Type Meters

NATHANIEL TUFTS METER WORKS

of

American Meter Company, Inc.

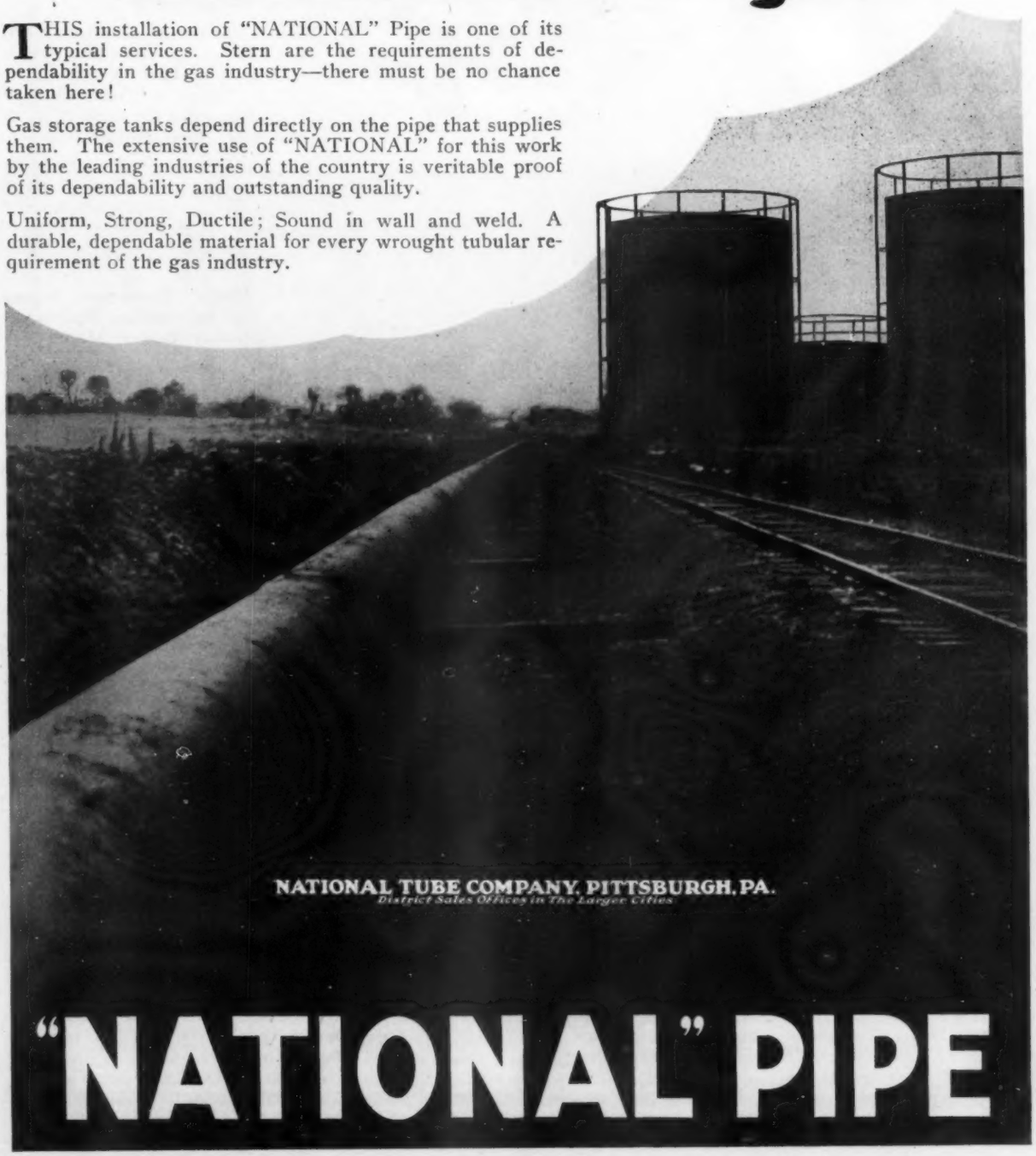
455 Commercial Street

Reliable Storage Depends on Reliable Pipe

THIS installation of "NATIONAL" Pipe is one of its typical services. Stern are the requirements of dependability in the gas industry—there must be no chance taken here!

Gas storage tanks depend directly on the pipe that supplies them. The extensive use of "NATIONAL" for this work by the leading industries of the country is veritable proof of its dependability and outstanding quality.

Uniform, Strong, Ductile; Sound in wall and weld. A durable, dependable material for every wrought tubular requirement of the gas industry.



NATIONAL TUBE COMPANY, PITTSBURGH, PA.
District Sales Offices in The Larger Cities

"NATIONAL" PIPE

Production on Roper Sheet Flame Radiant Heater Getting Under Way

The Geo. D. Roper Corporation, of Rockford, Ill., which has recently taken over the Kennedy Sheet Flame Radiant Heater from the Radiant Heat Corporation of America, announces the removal of the manufacturing equipment from New York City to the Roper plant at Rockford. Production is rapidly getting under way.

The heater will now be known as the Roper Sheet Flame Radiant Heater and the same manufacturing, sales and advertising policies will be followed in the manufacture and distribution of this new Roper product as have been in effect on other Roper products, in the past. The Kennedy Heater is well known, has been approved by the American Gas Association Laboratory and has a national distribution.

* * *

American Brass Co. Opens New Office in Newark

The American Brass Company recently opened a new office at 1009 Military Park Building, 60 Park Place, Newark, N. J. This office is in charge of Mr. J. B. Benedict, agent, and Mr. L. B. Smith, agent, who will represent this company in promoting the sale of copper and copper alloy materials in all forms of Anaconda sheets, wire, rods and tubes. The territory covered comprises Newark and surrounding towns and the northern half of the State of New Jersey.

* * *

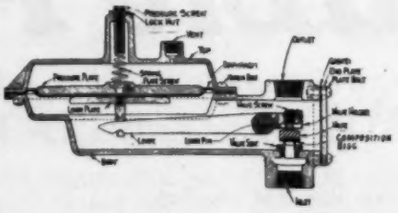
Founder of Missouri Fire Brick Company Dies

Mr. John Dell, founder and principal owner of the Missouri Fire Brick Company, passed away, after a long illness, on June 9 and was buried from his home in St. Louis June 11.

Mr. Dell has been connected with the fire clay industry for about fifty years, starting in with Evans & Howard Company, later with Laclede Fire Brick Company, and in 1894 started the Missouri Fire Brick Company.

Groble Regulator

A new gas regulator has just been announced by the Groble Gas Regulator Co., Anderson, Ind. The regulator was designed by Mr. J. C. Groble, who has had a long and practical experience in the gas and regulator business.



Mr. Groble states that in designing his new regulator he had ten fundamental principles in mind—namely—

1. Sensitive regulation. 2. To pass a large volume of gas with low inlet pressure. 3. Quick removable and interchangeable valve. 4. Removable valve seat or gas orifice. 5. Removable valve lever. 6. To seal more pressure with less mercury. 7. All parts standard and interchangeable. 8. Simplicity in construction. 9. Low maintenance cost. 10. The regulator can be repaired while installed. Some of the important features are as follows: The valve can be removed quickly and the valve disc renewed and replaced in a very short time. The valve seat can be changed if desired. The valve lever can be removed very quickly if desired. This can be done by removing the end plate from the regulator. The diaphragm can also be removed while the regulator is installed, if so desired. There are no joints or gaskets where pipes screw into connections, which eliminates all possibility of leaks when installing the regulator.

Descriptive booklet will be mailed on request to the company.

* * *

BARSTOW STOVE COMPANY BRINGS OUT NEW RANGE

A Number of Advantages Claimed

The Barstow Stove Company of Providence, R. I., has recently started putting a new range on the market in which certain distinctive advantages are claimed.

A top burner control on this range is claimed to save food, by eliminating burning due to utensil boiling dry; saving labor, by dispensing with dirt; saving gas, due to the thermostatic control.

The device is simple in that the release of two screws permits of the removal of the gas cock. The thermostatic element can be changed or removed without removing the gas cock.

Other features of this range are the insulation of the oven, porcelain burners designed according to the U. S. Bureau of Standards, ease of replacement of the various parts of the doors, body, linings, etc.

Complete illustrated descriptive matter will be sent upon request to the Barstow Stove Company of Providence, R. I.

* * *

Bailey Meter Company Issues New and Interesting Bulletin on Bailey Boiler Meter

The Bailey Meter Company of Cleveland, Ohio, has just issued a new bulletin, No. 43A, giving performance data concerning the Bailey Boiler Meter, which records steam flow, air flow, flue gas temperature and rate of coal feed. This bulletin tells of numerous instances where large savings have been effected by the use of boiler meters in industrial plants, as well as central stations. Chart records have been reproduced in color to show the kind of boiler operation obtained before and after the installation of the steam flow-air flow meter. This information, together with test data and cost figures showing the actual savings in fuel consumption, labor and additional boiler units, will prove of value to power plant engineers.

* * *

Large Gas Line to Supply Batavia

Batavia, N. Y.—The Republic Light, Heat & Power Company has awarded a contract for the supplying of additional gas service for Batavia. An eight-inch line will be laid from Corfu to Batavia, replacing the six-inch line now in use. The larger new line connects with the line laid last summer from Tonawanda to Corfu.

GAS DISTRIBUTION

Distribution Systems are the arteries which furnish the public with good service and should be well designed and installed to meet this condition

THIS COMPANY IS EQUIPPED WITH AN ORGANIZATION OF HIGH REPUTATION AND ABILITY TO MAKE SURVEYS AND REPORTS OF DISTRIBUTION SYSTEMS

WE HAVE THE MEN AND EQUIPMENT TO DO THE WORK OF FURNISHING AND LAYING DISTRIBUTION SYSTEMS OF ANY TYPE

At present we are engaged in main laying contracts for gas companies in many places

We would be glad to have you consult with us.

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421 Peoples Gas Bldg., Chicago **1419 Healey Bldg., Atlanta**

Efficient Purification Demands Exact Temperature Control

An exact knowledge of temperature conditions is absolutely indispensable in gas purification, for these temperatures determine to a great degree the efficiency of the process. Proper control that may be secured with the aid of recording thermometers assures the maximum removal of hydrogen sulphite from the gas with a minimum of purifying space. Recording thermometers are also of great assistance in determining the time to let down for revivification in the rotating of boxes.

Bristol's Recording Thermometers are guarding the efficiency of the purification process in scores of gas plants. Their unfailing accuracy and honest service have proved their superiority in this work.

Confer with our engineers on your instrument problems

The Bristol Company Waterbury, Connecticut

BRISTOL'S RECORDING INSTRUMENTS

FULTON DUPLEX
Sensitive
GAS GOVERNOR

for high pressure transmission

This governor is designed to meet the needs of artificial and natural gas companies who desire to control a high and varying inlet pressure and reduce it to a low and unvarying outlet pressure, for illuminating or fuel purposes.

The materials used in its construction are resistant to the chemical action of all manufactured gases; all frictional surfaces are eliminated, and the diaphragm surface is increased by the use of two diaphragms, thus giving it vastly greater sensitiveness and power over governors equipped with but one diaphragm.

The Fulton Gas Governor is easily and quickly installed and requires a minimum of attention afterward.

Write for complete Catalogue

The Chaplin-Fulton Mfg. Co.

28-34 Penn Ave. Pittsburgh, Pa.

ALL WORKING PARTS
100% Accessible
While in Pipe Line

Every Engineer will appreciate the advantages now offered by Reynolds in the MODEL 10 Series (the latest addition to our complete line). In addition to the complete accessibility of all working parts, all parts are so accurate that they are **interchangeable.** In fact—anything in the way of adjustment or repair may be done while the Regulator is connected in the customer's lines. Details on request.

The Valve Pocket may be removed separately by a turn of the thumb screw.

With or Without Mercury Seal

Either type is available. Model 10 without mercury seal will give perfect service where inlet pressure does not exceed 5 lbs. Where pressure is greater than 5 lbs., the mercury attachment should be specified. These two styles are made either with dead weight or spring type adjustment.

New Efficiency in operation!

A consultation with our Gas Control Engineers may solve your problem. Write!

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Gas Control Since 1892

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Will Help Increase Profits

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We Will Help You!

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The Home Incinerator —a portable gas-fired incinerator which positively solves the waste disposal problem, is moderately priced—the only Incinerator in the field which will dispose of table waste as well as household accumulations.

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Write now for your copy of this illustrated plan book.

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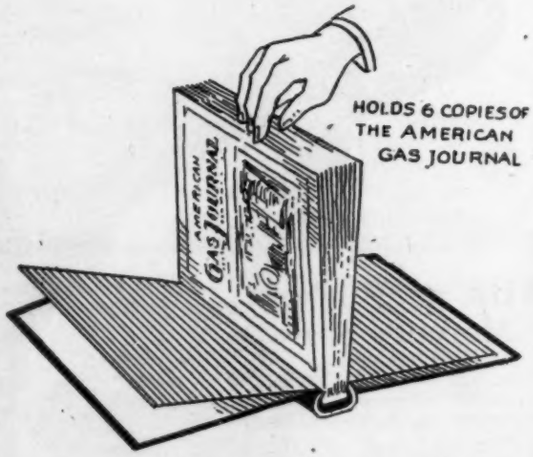
We have for this purpose a spring-back binder, heavy covers, bound in leatherette, size 9½"x12½". There are no screw plugs to take out or punching of holes in sheets—just spring back the covers and insert new sheets and they are securely held in place.

This binder will hold six complete copies of the American Gas Journal.



This binder usually retails at $2.50 in the average stationery store. It is one that will look exceedingly well on the shelves of any library, and is offered to our subscribers at cost, $1.25 each, postpaid.

Make checks or money orders payable to American Gas Light Journal, Inc.

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Consider the high cost of repainting when specifying paint and use one that will not have to be renewed in a few years.

The Dixon Line of Graphite Paints is one that will fully meet your requirements as to long-life and economy! They will give better protection for exposed metal or wood work at lowest cost per year of service.

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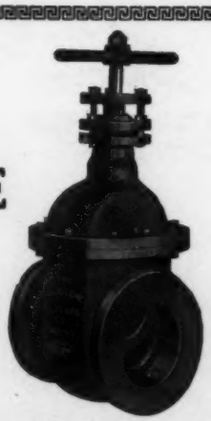

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are prominent characteristics of all Stacey Bros. Holders. These three essentials which have been proved over and over in our long and varied service to the gas industry, serve to confirm our

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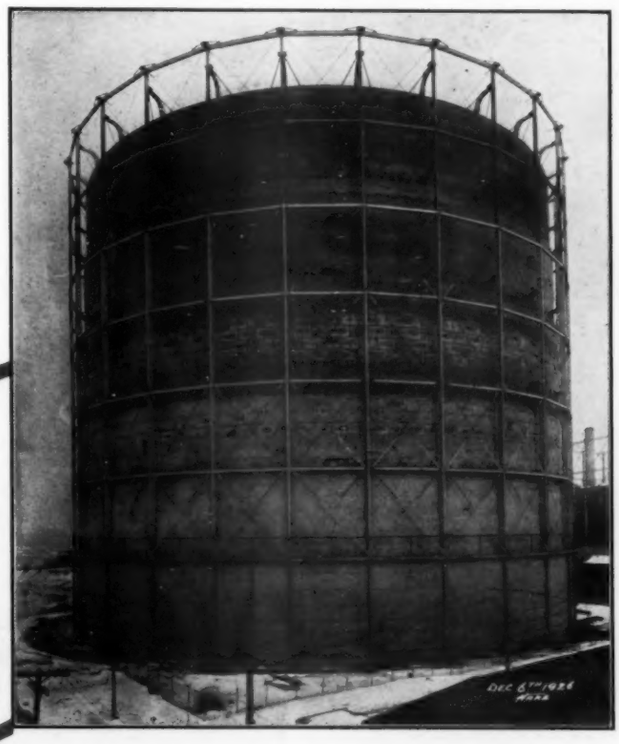

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NEW YORK OFFICE—350 Madison Ave.—P. F. McEnaney, Mgr. Tel. Vand. 7219
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The STACEY BROTHERS (J. E. and A. J. STACEY) are the Pioneer Holder Builders of America

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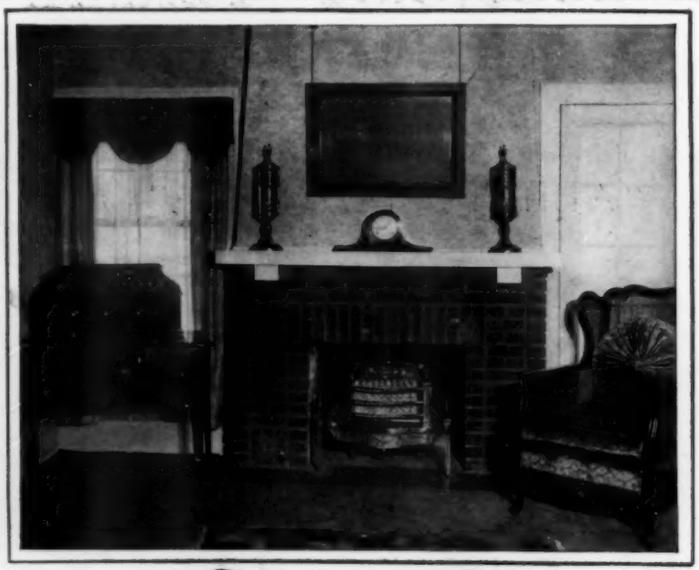

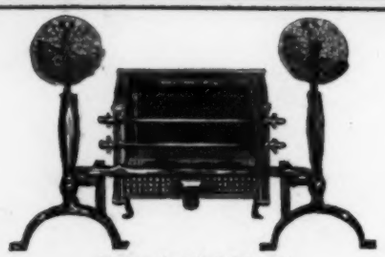
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No. 30

No. 25

No. 115A

No. 80

The name Radiantfire is the exclusive property of this company and duly protected by law. There are many gas heaters on the market but just one Humphrey product and one Humphrey standard of quality.

This is a good thing to remember because there can certainly be no substitute when genuine merchandise is available at no greater cost.

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The Pacific Coast Gas Association wanted to be able to

Pick the Good from the Bad

and found, in its study of the question, that no judgment could be made until a standard laboratory procedure had been developed. This study has resulted in the

Gas Appliance Testing Code

The only manual of laboratory practice in gas appliance testing now in print.

AUTHORITY

Prepared and edited by the Technical Section of the Pacific Coast Gas Association under the supervision of E. L. Hall of the Portland (Oregon) Gas & Coke Company, Chairman of the Section. The special committee which compiled this volume was headed by R. M. Conner, now Director of the Gas Appliance Testing Laboratory of the American Gas Association. Mr. Conner was assisted by Walter M. Berry, formerly Gas Engineer of the Bureau of Standards and now Executive Engineer of the California Gas Research Council, and Prof. S. H. Graf of the Oregon State Agricultural College.

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1. **INTRODUCTION—**
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2. **DEFINITIONS—**
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4. **GENERAL CONSIDERATIONS—**
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5. **METHODS FOR TESTING DOMESTIC GAS APPLIANCES—**
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"Gosh! That Ridgway Elevator Has Everything!"

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The man was watching the Ridgway Elevator stopping level with the floor so the electric truck would pass on without a bump.

The man was right. The Ridgway Elevator "has everything desirable in an elevator."

YOU CAN'T MENTION A DESIRABLE FEATURE IT DOES NOT HAVE.

Here are a few suggestions—

1. It is the only elevator any school boy can test for efficiency by weighing the steam used.
2. It costs actually nothing to run.
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4. It can not go into the overhead.
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7. It goes when the power is shut down.
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9. It stops level with the floors.
10. It cuts out the fire hazard.

These are just 10 of the Perfections. If they seem extravagant claims we beg to remind you that you do not pay for Ridgway Elevators until they make good.

If you want proof please note the Biggest and Best Concerns are they which

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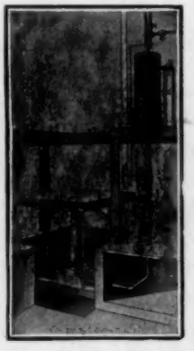
Over 3,000 in daily use **COATESVILLE, PA.**

Double Geared



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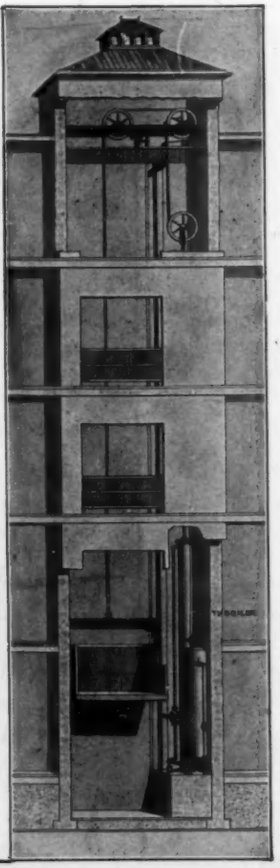

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Having faithfully served the gas industry for 3,536 weeks during the past 68 years, the American Gas Journal will make its initial appearance in August as a Monthly Publication.

This change was induced by our sincere desire to better serve the gas industry and, as we felt we could do this best by issuing the Journal monthly instead of weekly, we asked the opinions of our subscribers and advertisers to learn if we were correct in our surmise.

The response from both classes was almost unanimous in favor of the monthly.

Therefore, to meet the popular need as expressed in these answers, the Journal will appear in an entirely new dress from cover to cover about August 10th, and each month thereafter about the same date.

It is our aim to make this Monthly issue of the Journal the most complete and instructive ever presented to the gas industry. New sections designed to cover every department in the manufactured gas plant, as well as the natural gas field and allied industries, will be a strong feature, made possible by the change.

The longer time between publication dates—as compared to a weekly—will enable our editors to gather together the highest grade of articles and give a better resume of the news and doings within the industry than was possible with a weekly.

We know you will appreciate the forthcoming change in the Journal and co-operate in making this publication, as it has always claimed to be for 68 years, the "Gas Man's Own Paper."

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All Goodman Stoppers are now equipped with the Improved Patented Locking Sleeve, which locks both handles to the pipe. Stopper cannot slip.

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Highly recommended by Important Engineers—Range Experts — and Range Manufacturers.
Prevents Serious Hazards caused by venting gas ranges to the outside.
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See also Stoppers.

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Metering the gas consumed by various types of gas heaters presents a new problem. The gas company is primarily interested in the accurate registration of gas consumed and a long period of satisfactory service. The consumer, on the other hand, fearing that he is about to "buy the gas company," is interested in the amount of gas which he will consume and is inclined to judge the amount by the size of the meter installed. As a solution to this problem, the 30-A meter has proved itself ideal. With a capacity of 875 cu. ft. per hour at a one-half inch loss in pressure across the meter, it will safely accommodate all normal household loads through peak ranges whether natural or manufactured gas is used.

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30-A Meter Specifications

Capacity with ½ in. drop in pressure	875 cu. ft.	Approximate shipping weight	83 lbs.
Threaded connection for iron pipe	1¼ in.	Overall height	24⅞ in.
Plain connection for lead pipe	1½ in.	Width to outside of caps	21 in.
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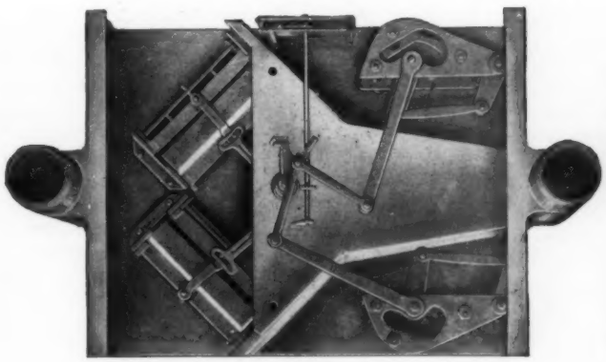

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Enlarged valves with special guides; Compound levers for double diaphragms.

Showing:
Double diaphragms with equalizers.

The "C" METER is a NEW development in the larger sizes of THE MARYLAND "B" METER, with Tin Case and retaining the established principle for Positive Displacement Measurement in the two-diaphragm, slide-valve method of Operation.

THE MARYLAND "B" TYPE GAS METERS
THE MARYLAND "C" TYPE GAS METERS

Southern Representative
J. E. Montgomery, 1500 South Tenth Ave., Birmingham, Alabama

"A" METERS

23 YEARS RECORD

Economy of space is being studied more attentively by architects as building costs increase. Gradual increase of the house heating load is an acknowledged fact. The capacity of the Meter must therefore increase more rapidly than its space dimensions. These conditions are responsible for the steadily expanding demand for "A" type meters because of their high capacity, small size and slow speed.

Pride in past achievement finds its best expression in constant effort towards improvement.

The new slow-speed 5-A meter, with its silent valve (a new feature), continues the twenty-three years' successful record of its predecessor, with promise of even greater service and satisfaction.

The patent tangent, permitting a shift without the use of a soldering iron, and the Phosphor bronze flag and valve arm bearings are valuable improvements.

The guaranteed minimum capacities are:

5-A	175	cubic	feet	per	hour
10-A	375	"	"	"	"
30-A	875	"	"	"	"
60-A	1500	"	"	"	"
150-A	3400	"	"	"	"

The whole range of customers demands are met by carrying only five sizes of meters in the stock room.

JOHN J. GRIFFIN & CO.

1513 Race Street

Philadelphia

559 West 47th Street New York City

LE N 30

If you are not selling one of the following famous makes of Red Wheel Lorain-equipped Gas Ranges, then you are NOT selling the type of cooking-appliance for which the greatest demand has been created:

CLARK JEWEL

George M. Clark & Company Division,
CHICAGO, ILL.

DANGLER

Dangler Stove Company Division,
CLEVELAND, OHIO

DIRECT ACTION

Direct Action Stove Company Division,
LORAIN, OHIO

NEW PROCESS

New Process Stove Company Division,
CLEVELAND, OHIO

QUICK MEAL

Quick Meal Stove Company Division
ST. LOUIS, MO.

RELIABLE

Reliable Stove Company Division,
CLEVELAND, OHIO

American Stove Co.

ST. LOUIS, MO.

Red Wheel Gas Ranges are Easiest to Sell

IN this day and age the retailer who attempts to do the entire job of advertising and selling his various lines of merchandise is throwing a large share of his legitimate profits out the window.

There is hardly a class of merchandise on the market today that does not boast of a "leader"—an outstanding product for which there has been created the *greatest* demand because of its inherent "goodness" and the reputation of its maker, stimulated by national advertising and aggressive sales methods.

Steinway Pianos, Campbell's Soups, Cadillac Motor Cars and Red Wheel Gas Ranges—each in its respective field—enjoy this "leadership", and the dealer who sells any one of these products has a franchise that is invaluable.

American Stove Company, manufacturer of Red Wheel Gas Ranges, like the leaders in other industries, has assumed a large proportion of the retailer's job and expense of advertising and selling.

A recent impartial investigation of considerable scope discloses the fact that out of several hundred women who were in the immediate market for a new gas range, 40% expressed a preference for one with the Red Wheel. The preference for the remaining 60% was spread over a hundred makes of ranges.

With campaigns of even greater proportions being planned to sell more Red Wheel Gas Ranges, plus knowledge of the aforementioned fact, how can any retailer of gas ranges intentionally overlook the profit-possibilities of the Red Wheel franchise?

Before another week has passed we suggest that you write to one of the Divisions of American Stove Company listed on the preceding page and ask that a representative be sent. He'll give you full information regarding advertising and selling plans, catalogs, price lists and any specific information you may want.

AMERICAN STOVE COMPANY :: 801 Chouteau Ave. :: St. Louis, Mo.

World's Largest Manufacturers of Gas Ranges

THESE FAMOUS GAS RANGES ARE EQUIPPED WITH LORAIN:

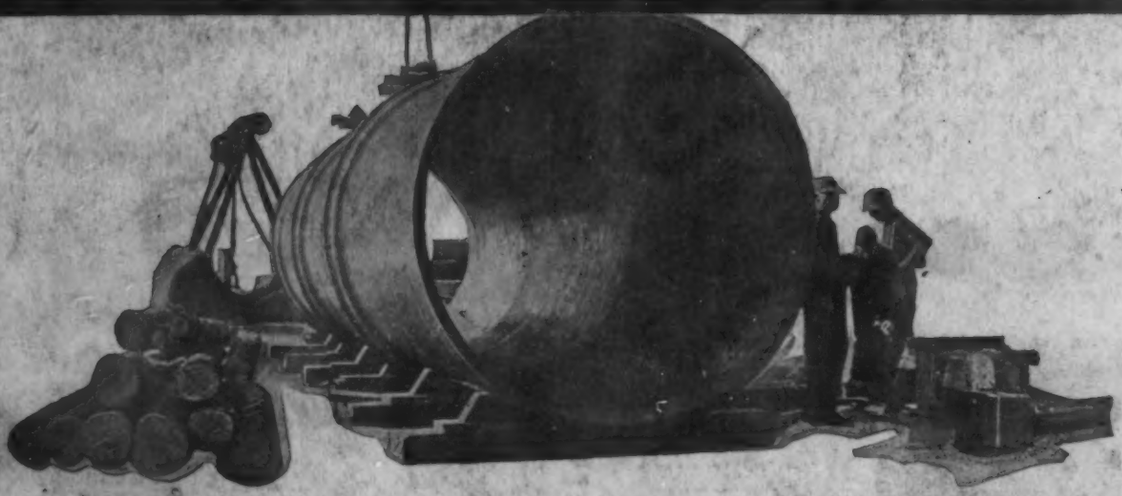
DIRECT ACTION	NEW PROCESS	CLARK JEWEL
DANGLER	QUICK MEAL	RELIABLE

7-27

Metric Metal Works of

American Meter Co. Inc.

Boston selected 84" cast iron pipe



Where permanence and low maintenance cost are essential

~ Cast Iron Pipe is chosen!

Makers of deLavaud Centrifugal Cast Iron Pipe PATENTED

Municipal, industrial or construction engineers are invited to write for literature covering cast iron pipe and fittings for all purposes.

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New York: 71 Broadway
San Francisco: 3rd & Mark Sts.
Pittsburgh: 6th & Smithfield Sts.
Dallas: Akard & Commerce Sts.
Kansas City: 13th & Locust Sts.
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